

A TAXONOMIC REVIEW OF THE COLEOPHORIDAE (LEPIDOPTERA) OF AUSTRALIA

Contribution to the knowledge of the Coleophoridae, LXXXV

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The present taxonomic knowledge of the Coleophoridae of Australia is reviewed. Fifteen species are recorded here, of which nine are described as new: *Corythangela fimbriata*, *Coleophora leucocephala*, *C. nielseni*, *C. horakae*, *C. fuscosquamata*, *C. frustrata*, *C. rustica*, *C. albiradiata*, *C. consumpta*. The genitalia of *Corythangela galeata* Meyrick, *Coleophora crypsineura* (Lower), *C. tremefacta* Meyrick, as well as the larval case of *C. seminalis* Meyrick, are illustrated for the first time. Two new synonymies are established: *Plutella ochroneura* Lower, 1897 and *Coleophora pudica* Lower, 1905 are junior subjective synonyms of *C. serinipennella* Christoph, 1872. After examination of the external morphology and the genital structures, the genus *Corythangela* is transferred to the family *Batrachedridae*.

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Key words. – Coleophoridae; Batrachedridae; Australia; taxonomy; new species.

The present paper is the first in a series of revisions of 'non-palaearctic' Coleophoridae. It will be followed by revisions of species of the Afrotropical region, of South America, and of the Indian subcontinent. As a matter of fact, when studying all the palaearctic species described so far, I have also paid a lot of attention to the species outside the palaearctic region; their number is considerably smaller than those described from the Palaearctic; nevertheless they are essential for my aim to reach a satisfactory systematic organisation in the light of modern methodology. I have not examined the species of North America, a region that is seriously studied by my friend Dr. Jean-François Landry, of Ottawa, but at the moment I can affirm that I have revised all the type series of all the other species of the world. This will enable me to present a complete revision and a general survey of the distribution of the family of Coleophoridae. The present knowledge of Australian Coleophoridae is very poor and based only on publications by Lower (1897, 1905, 1917) and Meyrick (1897, 1921 a and b, 1922). In recent years Common (1970, 1990) has given a survey of what is known up till now. For that reason Dr. Ebbe Schmidt-Nielsen has rearranged all the material that he found in the museums of Australia, i.e. in Canberra and Adelaide, comprising the original material of the Lower collec-

tion as well as all the specimens received later on. I have received for study the types kept in the BMNH. All this has enabled me to give a survey of the Australian fauna of Coleophoridae as complete as possible at this moment.

Abbreviations for museums

ANIC: Australian National Insect Collection, Canberra, Australia. – BMNH: Natural History Museum, London, U.K. – RMNH: Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands. – MNHN: Muséum National d'Histoire Naturelle, Paris. – SAMA: South Australian Museum, Adelaide, Australia. – USNM: U.S. National Museum of Natural History, Smithsonian Institution, Washington

Checklist of the Coleophoridae of Australia

Corythangela Meyrick, 1897

galeata Meyrick, 1897

fimbriata sp. n.

Coleophora Hübner, 1822

serinipennella Christoph, 1872

ochroneura (Lower, 1897) syn. n.

pudica Lower, 1905 syn. n.

alyconipennella (Kollar, 1832)

seminalis Meyrick, 1921

leucocephala sp. n.

- crypsineura* (Lower, 1900)
tremefacta Meyrick, 1921
nielseni sp. n.
horakae sp. n.
fuscosquamata sp. n.
frustrata sp. n.
rustica sp. n.
albiradiata sp. n.
consumpta sp. n.

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SYSTEMATIC PART

Corythangela galeata Meyrick
(figs. 1, 2, 18, 34-44)

Corythangela galeata Meyrick, 1897: 300. — Lectotype ♀, 'Sydney N.S. Wales, 3/12/84', 'Lectotype ♀, *Corythangela galeata* Meyr., 1897, I.F.B. Common, 1966', 'Corythangela galeata' Meyr., 1/9, E. Meyrick det. in Meyrick Coll.', 'Meyrick Coll., B.M. 1938-290', BMNH [examined].

Corythangella galeata, sensu Capuse, 1973, typographical error.

Material examined. — 1♂ (slide BMNH 24450), Sydney, N.S.Wales, 9.XII.[18]77, paralectotype 4/9 (BMNH); 1♀ (slide BMNH 24463), Sydney, N.S.Wales, bred 3.II.[19]18, paralectotype 6/9 (BMNH); 1♂ (slide ANIC 2328), Black Mt., ACT, Light Trap, 12. Dec. 1963, I. F. B. Common (ANIC); 1♂ (slide ANIC 2317, wing slide), Rous, Richmond River, N.S.W., Sept. 1925, V. J. Robinson (ANIC).

Description. — The original description is exact and also corresponds to the specimens collected after the type series.

Male genitalia (figs. 34-36, 41-42). — Terminal part of gnathos (fig. 41) two transverse plates with lamellae stellate. Tegumen constricted medially with two short pedunculi. Transtilla broad and short, suboval, joined medially. Valvula weakly delineated. Cucullus short, well sclerotized, narrower at base. Sacculus narrow and long, rather oblique, with heavy

lateral margin, with protrusion in form of sclerified wedge directed inwards, extended to base of cucullus; also with extension in distal part in form of wedge, exceeding cucullus in length. Juxta rounded, suboval, shield-like. Aedeagus (fig. 35) attenuate, very long, containing two series of cornuti (fig. 42): one, typical of Coleophoridae, formed by ten needle-like cornuti of varying lengths in long row; the other formed by a great number of very small spines in distal third part of aedeagus.

Structure of abdominal supports (fig. 37). — No posterior lateral struts; transverse strut arched, thicker in middle. Tergal disks (fig. 44) very long and narrow, with short conical spines similar to those of Batrachedridae. Female with less convex transverse strut and shorter tergal disks (fig. 40).

Female genitalia (fig. 38). — Papillae anales long, oval, with short bristles. Apophyses posteriores about 0.3 times length of apophyses anteriores. Sterigma (fig. 39) narrow, rather long, sclerotized, rounded at distal margin, with some bristles. Ostium bursae small, oval. Colliculum chaliced, transparent, except for two reinforcements at margins of extension that connects to ductus bursae. Ductus bursae long, about 12 times longer than sterigma, with lining (fig. 43) of very small rounded spines all along its surface; ductus narrow in distal part, widened progressively in central part and narrowed again in proximal part; bursa copulatrix oval; signum absent.

Biology. — According to the original description, also reported by Common (1990: 241) 'the larvae construct a slender, elongate case from small pieces of the twigs of *Casuarina* (Casuarinaceae) on which they feed.' Unfortunately the original series kept in the BMNH as well as the specimens in ANIC are without larval cases so that it is impossible to illustrate the cases.

Distribution. — Coast and tablelands of New South Wales.

Corythangela fimbriata sp.n.
(figs. 3, 19, 45-48)

Type material. — Holotype ♂ (slide ANIC 2341), 15 miles N of Northampton, WA, 18 April 1968, I. F. B. Common & M. S. Upton (ANIC).

Description. — Wingspan 10 mm. Head (fig. 3) light brown with brilliant sheen, laterally suffused with white. Labial palp white on inner surface and almost completely brown with bronzy sheen on outer surface; second segment almost as long as third. Basal segment of antenna white, dorsally suffused with beige and ventrally with brown, with thick tuft of short brown scales. Flagellum ringed white and very light beige, except for distal segments (about 30)

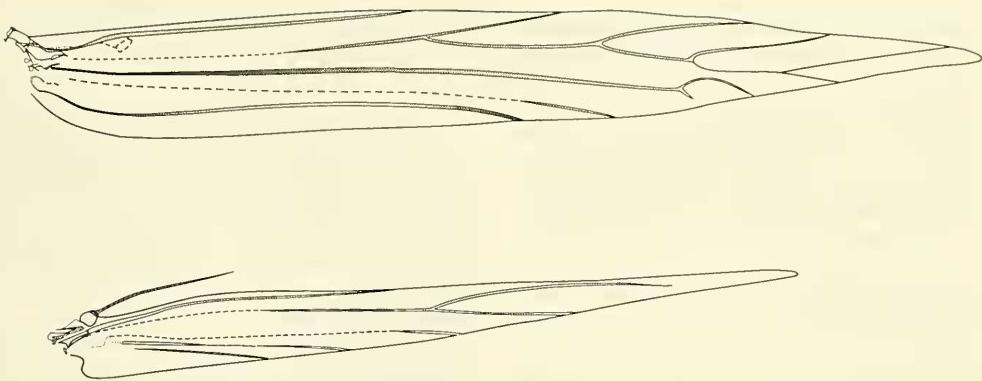


Fig. 1. *Corythangela galeata* Meyrick. Wing venation.

ringed white and dark brown. Thorax light brown with brown tegulae, suffused with white on internal border. Abdomen beige. Forewing with brilliant sheen, white, suffused with beige from costa towards dorsum; bronzy brown narrow streaks along median part, anal vein and dorsum, with incomplete line along internal margin of white costal line. Fringes beige, except for costal portion light brown with white base. Hindwing light brown, with beige fringes.

Male genitalia (fig. 45). — Terminal part of gnathos globular, with long lamellae stellate. Tegumen long, with very short pedunculi. Transtilla sclerotized, subtriangular, little developed. Valvula suboval, heavily sclerotized, poorly delineated. Cucullus short and stout, heavily sclerotized, curved distally. Sacculus very narrow and long, ended in narrow and long point, slightly curved; base with large and rounded protuberance folded towards base of cucullus. Juxta 'V'-shaped. Aedeagus (fig. 46) without cornuti, small and curved, shaped like sharp thorn, with small spines in ventral part of distal half.

Structure of abdominal supports (fig. 48). — Posterior lateral struts only slightly pronounced, transverse strut big, slightly convex, thicker in middle. Tergal disks with short conical spines, resembling those of Coleophoridae more than those of Batrachedridae; disks of third tergite about 4.5 times longer than wide.

Diagnosis. — The new species can easily be distinguished from *C. galeata* by its external habitus as well as by the male genitalia (the female is not known). In the genitalia the most obvious structures are the transtilla and the aedeagus: in *galeata* the transtilla is compact, whereas in *fimbriata* it carries two long extensions; the aedeagus in *galeata* is rather long and straight, with many cornuti, whereas in *fimbriata* it is short and curved, without cornuti.

Biology. — Unknown.

Distribution. — 45 km. north of Geraldton.

Remarks on the genus *Corythangela* Meyrick, 1897. — When examining the two known species of *Corythangela* one is struck first of all by the fact that the antennae are about as long as the forewings, whereas they are much shorter in Coleophoridae. The forewings are slightly narrower and longer than those of Coleophoridae. The head is narrower and longer.

As to the structure of the genitalia it can be said that those of the male generally resemble those of the Coleophoridae, however with obvious differences: the terminal part of the gnathos has thick lamellae arranged in a stellate form, whereas normally in the Coleophoridae the lamellae are thin and short, arranged in transverse rows. The valvula and cucullus have shapes that do not occur in Coleophoridae. The aedeagus is completely different, in *galeata* as well as in *fimbriata*, which also differ completely from each other. In any case, neither of them resembles the intromittent organ of the Coleophoridae, which was the object of study of Razowski (1989, 1990), who introduced the term 'phallotheca' for the organ in Coleophoridae. Moreover, in the two species of the genus *Corythangela* a separate juxta is present, whereas in Coleophoridae the juxta is fused with the aedeagus and has a prolongation in two rods, either separate or joined together (Landry 1993). This juxta configuration causes problems when lifting the 'phallus complex' from the rest of the genitalia during preparation, whereas that operation is rather simple in *Corythangela*. The female genitalia, only known for *galeata*, are similar to those of Batrachedridae.

The structures of abdominal support are similar to those of Batrachedridae in *galeata*, whereas in *fimbriata* they resemble more those of the Coleophoridae:

the tergal disks are shorter and wider than in *galeata*, and the spines are thicker and more firmly attached to the tergal disks.

In spite of the fact that I have not been able to study the larval case of *galeata*, which was not kept with the type series, the biology, as described by Meyrick is typical of Batrachedridae (Hodges 1978).

In view of this I transfer the genus *Corythangela* to the family Batrachedridae.

Coleophora serinipennella Christoph
(figs. 7, 20-23, 49-65)

Coleophora serinipennella Christoph, 1872: 31.

Plutella ochroneura Lower, 1897: 59 syn.n. – Holotype ♂ of *Plutella ochroneura* Lower: ‘Semaphore, S.A.’, genitalia slide Bldz 9186 (SAMA) [examined].

Corythangela ochroneura, sensu Vives, 1988.

Coleophora stefanii de Joannis, 1899: 331.

Coleophora pudica Lower, 1905: 111, syn.n. Lectotype ♂ (here designated) of *Coleophora pudica* Lower: ‘3224, Broken Hill’ genitalia slide Bldz 9187 (SAMA) [examined]; paralectotypes: 2♂ ‘Broken Hill, 4.4.99’ (slides Bldz 9188, 9189) (SAMA).

Corythangela pudica, sensu Vives, 1988.

Coleophora novella Chrétien, 1926: 9.

Coleophora caliacrella Caradja, 1931: 331.

Coleophora caliacrella lucidella Caradja, 1932: 43.

Coleophora jerichoella Amsel, 1935: 306.

Coleophora jordaniella Amsel, 1935: 306.

Coleophora sisisperma Meyrick, 1936: 621.

Coleophora deserticola Toll, 1944: 292.

Coleophora soffneri Toll, 1944: 292.

Material examined. – 1♂, Grey Range, 5 miles W of Tickalara, south-west Qld, 14. Nov. 1949, I. F. B. Common; 1♂ (slide ANIC 2300), Mungadal Station, NSW, 7.iii.1985; 8♂ (slide ANIC 2308), 10 mi NE by E of Iron Knob, SA, 23 Oct. 1968, Britton, Upton, Balderson; 3♂, 6 miles W of Iron Knob, SA, 16 Mar. 1968, I. F. B. Common & M. S. Upton; 11♂, 2 mi. SSE of Ceduna, SA, 30 Oct. 1969, Key & Upton; 6♂, 31.22S 131.47E, 14 km NNW of Yalata Mission, SA, 9 Apr. 1983, 10 May 1983, E. S. Nielsen, E. D. Edwards; 1♂, 40 miles E of Nullarbor, SA, 18 Mar. 1968, I. F. B. Common & M. S. Upton; 2♂, 31.23S 131.24 E, 48 km E by N Nullarbor, SA, 13 Oct. 1981, J. C. Cardale; 3♂, 31.25S 131.07E, 13 mi E of Nullarbor HS, SA, 31 Oct. 1969, Key & Upton; 1♂, 23 mi W of Nullarbor HS, SA, 5 Oct. 1968, Key, Upton, Balderson; 4♂ (slide ANIC 2306), 25 miles E of Eucla, WA, 19 Mar. 1968, I. F. B. Common & M. S. Upton; 1♂, 5 miles E of Eucla, WA, 6 Jan. 1967, M. S. Upton; 1♂, 6 mi E of Madura, WA, 15 Oct. 1968, Britton, Upton, Balderson; 2♂, Madura, WA, 20 Mar. 1968, I. F. B. Common & M. S. Upton (slide ANIC 2305); 3♂, Madura, WA, 7 Oct. 1968, Key, Upton, Balderson; 1♂, 7 mi E by N of Balladonia HS, WA, 13 Oct. 1968, Britton, Upton, Balderson; 1♀ (slide ANIC 2307), Kalgoorlie, WA, 19.x.1963, V. J. Robinson; 4♂, Drummond Cove, 11 km N of Geraldton, WA, 13 Apr., 17 Apr., 23 Apr., 26 Apr. 1973, N. McFarland; 1♂ (slide ANIC 2298), 107 miles S of Carnarvon, WA, 21 Apr. 1968, I. F. B. Common & M. S. Upton; 3♂ (slides ANIC 2304, 2297), 8 miles E of

Carnarvon, WA, 20 Apr. 1968, I. F. B. Common & M. S. Upton (ANIC).

Male genitalia (fig. 49). – Spinose part of gnathos big, globular. Tegumen constricted medially, with widened subtriangular pedunculi. Transtilla long, triangular, weakly joined in middle. Valvula large, rounded, irregularly sclerotized, covered with short bristles. Cucullus oblique, sometimes narrower medially, rather variable. Sacculus simple, characterized by thick ventral margin and by a process on lateral margin: outline variable (figs. 51-54, 55-62), rounded, conical, subtriangular, or truncate. Phallotheca conical, slightly curved, short, sclerotized only at base and on dorsal surface. Vesica, without cornuti, pronounced along the entire ventral lamina.

Structure of abdominal supports (figs. 50, 65). – Posterior lateral struts 1/3 of length of anterior ones. Transverse strut very thick, in the male convex on distal margin, in the female wider and slightly arched. Tergal disks with many small conical spines; disks of third tergite 5 times longer than wide.

Female genitalia (fig. 63). – Papilles anales small, suboval, with short bristles. Apophyses posteriores about 0.4 longer than anterior ones. Sterigma (fig. 64) trapezoid, weakly sclerotized, with long bristles on distal margin. Ostium bursae narrow, ogival. Colliculum chaliced. Ductus bursae with distal section as long as sterigma, narrow, with two parallel sclerotized bands; anterior section of ductus bursae membranous, gradually widened towards bursa copulatrix. Bursa long, bag-shaped, with a big leaf-like signum, with a long pedunculus.

Diagnosis. – *Coleophora serinipennella* is the only representative species of its group in Australia (the 8th of Toll’s system). The variation of the forewing colour pattern occurs scatteringly throughout the wide area of distribution of the species, but reaches its most extreme forms in Australia, particularly the dark form caused by the brown colour of the scales along the veins, which is known only from Australia: that variability has undoubtedly induced Lower to describe the same species twice. Also noteworthy is the variability of the sacculus in the male genitalia: although a common phenomenon in specimens of *serinipennella*, it has reached extreme forms in Australian specimens.

Biology. – The species mines the stems of various species of Chenopodiaceae. Common (1990: 241) writes: ‘at least one endemic species produces galls in the stems of Chenopodiaceae in inland New South Wales’.

Distribution. – From Japan to North Africa, and in Europe where it has been collected in Bulgaria, Rumania, Greece, Sicily, southern Italy (Calabria), southern France, Spain (Baldizzone 1994: 55). In

Australia: South-western Queensland, South Australia and arid areas of Western Australia south of Carnarvon.

Coleophora alcyonipennella (Kollar)
(figs. 5, 66-72)

Ornix alcyonipennella Kollar, 1832: 99.

Coleophora cupriariella Zeller, 1847: 36.

Coleophora cuprifulgella Toll, 1962: 652.

Material examined. — 1♂, 27.35S 151.59E, Prince Henry Heights, 620 m, Toowoomba, Q., 4 Jan. 1983, I. F. B. Common; 4♂, N. Tamborine, Q., 23 Aug. 1965, M. S. Upton; 1♂ (slide H 17), Tooloom Scrub, 20.i.36, W. B. Barnard; 1♀ (slide ANIC 2327), 26 mls S of Singleton, NSW, 7 Nov. 1960, I. F. B. Common & M. S. Upton; 1♀, 1 spec., Mt Tomah, NSW, 3000 ft, 18 Dec. 1967, M. S. Upton; 1♂, 1♀ (slide ANIC 2375), Mt Keira, NSW, 23.xii.1963, 8.xii.1972, V. J. Robinson; 1♂, 1♀, 1 spec, CSIRO Experimental Farm Wilton, NSW, 2.i.1973, 29.ix.1980, V. J. Robinson; 1♂, 1♀, George's Basin, NSW, 28 & 30.viii.1965, V. J. Robinson; 1♂, 25 km NNW of Barellan, NSW, 23.ii.1974, E. D. Edwards & M. Story; 1♂, Mittagong, NSW, 28.i.36, [A. J. Turner]; 1 spec. (slide H 52), Goulburn District, NSW, 24.i.1963, R. W. Shelley; 1♂ (slide H 15), Canberra, ACT, 22.ii.1948, I. F. B. Common; 1♂, 1♀ (slide ANIC 2376), Canberra, ACT, 10.xii.1948, 26 Nov. 1948, I. F. B. Common; 11♂ (slide ANIC 2323, wing slide W 56), 1 spec., Black Mt., ACT, Light Trap, 17 Jan. 1961, 30 Feb. 1954, 21 Mar. 1963, 20 Oct. 1959, 15 Nov. 1956, 21 Nov. 1962, 10 Dec. 1963, I. F. B. Common; 3 spec., 2♂ (slide ANIC 2325), Broulee, NSW, 24 Feb. 1962, 13 Oct. 1962, M. S. Upton; 1♂, Mt Dromedary, NSW, 1000 ft., 24 Nov. 1965, I. F. B. Common & M. S. Upton; 5♂ (slide ANIC 2326), Mt Kosciusko, NSW, 5500 ft., 17 Feb. 1968, M. S. Upton; 1♂, 37.43S 145.48E, 10 km ENE of Warburton, Vic., 210 m, 17 Jan. 1979, I. F. B. Common, E. D. Edwards; 1♂, 1 spec., Gisborne, 16.xi.25, 29.xii.23, G. Lyell; 2♂, Little Desert, 13 miles S of Kiata, Vic., 7 Nov. 1966, I. F. B. Common & M. S. Upton; 3♂ (slide H 18), St Helens, Tas., 24.i.38, [A. J. Turner]; 1♂, Cradle Mt., Tas., 3000 ft, 8.iii.24, [A. J. Turner]; 1♂, 1 spec., Burnie, Tas., 10.ii.25, [A. J. Turner]; 1♂, Strahan, Tas., 6.ii.25, [A. J. Turner]; 1♀, Wilmot, Tas., 1.ii.25, [A. J. Turner]; 1♂, 8 mls SW Waratah, 1800 ft., T., 16 Feb. 1963, I. F. B. Common & M. S. Upton; 2♂, 1♀ (slide ANIC 2324), Hobart, Tas., 2.ii.36, [A. J. Turner]; 1♀, Mt Wellington, Tas., 2500 ft, 6.ii.36, [A. J. Turner] (ANIC).

Male genitalia (fig. 66). — Spinose part of gnathos narrow, pear-shaped. Tegumen subtriangular, narrower at base of gnathos arms, widened with two long, moderately wide, pedunculi on external lateral margin. Transtilla short, triangular, weakly joined in middle. Valvula big, irregularly oval. Cucullus of average length, narrower at the base. Sacculus curved and thick on lateral margin ended dorsally in short triangular thorn-like process. Phallotheca conical, sclerotized only at base and on dorsum, the latter with

a long fold. Cornuti (fig. 68) 6-7 spines of different lengths, united into a curved row.

Structure of abdominal supports (figs. 69, 72). — No posterior lateral struts. Transverse strut with almost straight dorsal margin and biconvex distal one. Tergal disks with short conical spines, almost twice longer than wide (third tergite).

Female genitalia (fig. 70). — Papilles anales pointed, with small needle-like bristles. Apophyses posteriores twice length of anterior ones. Sterigma (fig. 71) trapezoid, curved on distal margin, which has small, needle-like bristles. Ostium bursae small, oval. Colliculum chaliced, traversed by median lamina of ductus bursae, extended to middle of ductus. Ductus with spinose section about half length of ductus with small conical spines. Central part of ductus curved, almost transparent, faintly speckled, anterior part transparent, widened gradually towards bursa copulatrix. The latter bag-shaped with big leaf-like signum.

Diagnosis. — In Australia *C. alcyonipennella* is the only representative of the group of green-metallic Coleophoridae, so there is no possibility of mistaking it for another species. It was imported from Europe with animal fodder and it shows no differences with specimens from the countries of origin.

Biology. — Common (1990: 241, 242) has given a good description of the species, together with some information on the biology, and two drawings of the pupa. He indicates that in Australia *C. alcyonipennella* larvae feed on *Trifolium repens*, *T. fragiferum* and *Medicago* sp.

Distribution. — Europe, Asia Minor, Irak, Iran, Afghanistan, Pakistan, Japan (Baldizzone 1994:18); the more humid areas of southern Queensland to Tasmania; New Zealand (Common 1990).

Coleophora seminalis Meyrick
(figs. 4, 17, 73-79)

Coleophora seminalis Meyrick, 1921a: 189.

Coleophora immortalis Meyrick, 1922: 556.

Coleophora immortalis sensu Vives, 1988: 84, typographical error.

Material examined. — 2♂ (slides ANIC 2354, 2353), Bamaga, Cape York, Q., 26 & 28 Mar 1964, I. F. B. Common & M. S. Upton; 1♂ (slide ANIC 2331), 9 miles W of Paluma, 2500 ft., Q., 15 Apr. 1969, I. F. B. Common & M. S. Upton; 1♀ (slide ANIC 2332), Yeppoon, Q., 18 Dec. 1964, I. F. B. Common (ANIC). Type material studied in Baldizzone (1989).

Male genitalia (fig. 73). — (Baldizzone, 1989: 205, figs. 66, 68, 69). Terminal part of gnathos big, oval. Tegumen trapezoid, considerably constricted towards three quarters, with two long pedunculi. Transtilla broad and flattened, irregularly oval. Sacculus broad, characterized by two triangular points at the angles:

the point at the dorso-ventral angle longer than that at the dorso-caudal angle. Phallotheca narrow and long, consisting of two sclerotized bands, one thinner and sharp at apex, the other thicker with a curved tooth at apex. Cornuti (fig. 75) 6-7, of different lengths, united into irregular row.

Structure of abdominal supports (figs. 76, 79). – (Baldizzone 1989: fig. 67) No posterior lateral struts. Transverse strut straight, its proximal edge thicker than distal one. Tergal disks (3rd tergite) about twice longer than broad.

Female genitalia (fig. 77). – (Baldizzone 1989: 205, figs. 70-73). Papilles anales narrow and long. Apophyses posteriores about twice length of anterior ones. Sterigma (fig. 78) trapezoid, distal margin convex with some bristles; with two folds parallel with sides of ostium bursae. Ostium bursae oval, opening at three quarters of sterigma. Colliculum tube-shaped, medially expanded. Ductus bursae with median line in its first half as far as the central curve; spiculate section of ductus about twice length of sterigma. Remainder of ductus almost transparent. Bursa oval, signum a small irregular oval plate with a longitudinal ridge. This signum varies considerably and can also have numerous rounded spines.

Diagnosis. – (Baldizzone 1989: 205). The species belongs to the 30th group of Toll's system and might be placed in the section of *C. glaucicolella* Wood.

Biology. – (Baldizzone 1989: 205). The species lives on various species of *Amaranthus* (*paniculatus* and *viridis*), according to the original description of *C. immortalis* Meyrick. The larval case (fig. 17), looks like that of *C. versurella* Zeller, 1849, which also lives on Amaranthaceae. In the description of *C. immortalis*, Meyrick had placed it near *C. amaranthella* Braun, 1919, a synonym of *C. lineapulvella* Chambers, 1878.

Distribution. – Fiji Islands, Java, eastern China, Australia, New Guinea, Sumatra (Baldizzone 1989: 205). In Australia: moist areas of Queensland north of Yeppoon.

Coleophora leucocephala sp.n.

(figs. 8, 24, 80-90)

Type material. – Holotype: ♂, 31.32S 137.14E, nr Lake Eyre South, SA, 18 Sept. 1978, E. D. Edwards; slide ANIC 2345 (ANIC). Paratypes: 1♀ (slide ANIC 2370), 29.37S 138.06E, The Frome River, 5 km NE of Maree, SA, 15 Sept. 1972, M. S. Upton; 2♂ (slides ANIC 2349, 2340), 1♀ (slide ANIC 2350), 30.04S 138.17E, Farina, 48 km NbyW of Leigh Creek, SA, 17 Sept. 1978, E. D. Edwards; 1♂ (slide ANIC 2346), as holotype (ANIC).

Description. – Wingspan 9-10 mm. Head (fig. 8) white, dorsally suffused with beige. Labial palps

white: second segment about 2.5 times longer than third, with wide area of brown scales on external lateral margin. Antennae white, with tuft of short, brown scales at root of the basal segments; flagellum ringed white and beige. Thorax and abdomen beige. Forewings greyish white, sprinkled with long, brown scales, mainly in dorsal half, from anal vein onwards. Fringes grey. Hindwings light beige; fringes grey.

Male genitalia (fig. 80). – Spinose part of gnathos large, globular. Tegumen constricted at base of gnathos arms and reinforced by sclerotized 'Y', with two long and wide pedunculi on external margin. Transtilla irregularly oval, more or less almond-shaped. Valvula small, with narrow and long ventral margin. Cucullus large, ear-shaped, compact. Sacculus narrow, characterized by thick and serrated lateral margin, with rounded tooth at ventral angle and sharper tooth at dorsal angle. Phallotheca formed by two slender and curved rods, one rod slightly longer than the other ended in curved point, other rod sharp. Cornuti about 10 (fig. 82), of different lengths, united into long formation. The male genitalia show a certain amount of variation, as can be seen in figs. 81, 84-87.

Structure of abdominal supports (figs. 83, 90). – No posterior lateral struts; transverse strut with thick and somewhat convex proximal margin, and almost straight distal one, more slender. Tergal disks, covered with conical spines with wide bases, are about 3 times longer than wide. (3rd tergite)

Female genitalia (fig. 88). – Papilles anales narrow and long. Apophyses posteriores about 2.2 times longer than anterior ones. Sterigma (fig. 89) subtrapezoid, with arched proximal margin and convex distal margin with some slender and long bristles. Ostium bursae oval, colliculum chaliced, long, narrowing into ductus bursae. Ductus medial line about 3/5 of length of ductus; spinose part as long as sterigma, covered with very small spines; anterior half of ductus transparent and widened into round bursa copulatrix. Signum a small, oval, sclerotized patch covered with rounded spines.

Diagnosis. – The new species belongs to the 30th group of Toll's system and according to the genitalia structure is close to *C. versurella*, a species so far not known from Australia. The most obvious differences are: in the male genitalia of *leucocephala* the cucullus is shorter and more compact; the sacculus is shorter, and serrated on the lateral margin; the phallotheca rods are more slender, without teeth at the apex as in *versurella*; the cornuti are more numerous, not divided into two sections. In the female genitalia of *leucocephala* both the sterigma and the colliculum are narrower; the spinose part of the ductus is rather shorter; and in the bursa the signum is a single, chitinous patch covered with spines.

Biology. — Unknown.

Distribution. — Dry areas of South Australia.

Coleophora crypsineura (Lower) comb.n.
(figs. 9, 25, 91-106)

Batrachedra crypsineura Lower, 1900: 419. Lectotype ♂ (here designated) 'Broken Hill', slide Bldz 9191 (SAMA) [examined]. Paralectotype ♀ (slide Bldz 9192) same label as lectotype; one specimen without abdomen, same label as lectotype, ♀ (slide Bldz 9190) 'Broken Hill, 19.10.08', 'types 3466' [collected after the name was published] (SAMA).

Material examined. — 1 ♂, Bourke, NSW, 25 Oct. 1949, I. F. B. Common (slide ANIC 2339); 1 ♂ (slide ANIC 2329), 1 ♀ (slide ANIC 2315), 149.11E 31.17S, 9 km W of Coonabarabran, NSW, 533 m, 2 Dec. 1974, I. F. B. Common & E. D. Edwards; 1 ♀, Wyperfeld National Park, Vic., 5 Nov. 1966, I. F. B. Common & M. S. Upton (slide ANIC 2338); 2 ♂ (slide ANIC 2358), 1 ♀ (slide ANIC 2359), 6 miles W of Iron Knob, SA, 16 Mar. 1968, I. F. B. Common & M. S. Upton; 1 ♀, 31.22S 131.47E, 14 km NNW of Yalata Mission, SA, 9 Apr. 1983, E. S. Nielsen, E. D. Edwards (slide ANIC 2369); 1 ♀, 13 mi. NE by E of Caiguna, WA, 14 Oct. 1968, Britton, Upton, Balderson (slide ANIC 2334) (ANIC).

Redescription. — Wingspan 9-19 mm. Head (fig. 9) white, dorsally suffused with beige. Labial palps white; second segment about 1.5 times longer than third, with brown scales on distal half of lateral margin, third segment white, except for brown ventral margin. Antennae white, basal segment with tuft of short, brown scales on ventral margin; flagellum ringed white and beige. Forewings greyish white, sprinkled with brown and ochreous scales, which form two longitudinal lines, one almost in middle of wing, the other between anal vein and dorsum. Fringes grey-beige. Hindwings and fringes grey-beige.

Male genitalia (fig. 91). — Spinose part of gnathos globular, long. Tegumen strongly constricted at base of gnathos arms, pedunculi arched. Transtilla narrow, long, irregularly oval. Valvula wide, compact, ear-shaped. Sacculus with rounded ventral margin, apical portion dentate. Phallotheca with two slender distally arched rods, longer rod with slightly curved and broadened apex. Cornuti (fig. 92) numerous (more than 20), of different lengths, united into narrow and long formation almost as long as vesica.

The male genitalia show some slight individual variation (figs. 96-99), mainly in the shape of the transtilla, the teeth on the lateral margin of the sacculus, and the apex of the phallotheca.

Structure of abdominal supports (figs. 93, 102). — No posterior lateral struts; transverse strut in male

with slender and curved proximal margin, distal margin straighter and more sclerotized at base of disks of 2nd tergite. Tergal disks with short conical spines with wide bases, about 3 times longer than wide (3rd tergite).

Female genitalia (fig. 100). — Papilles anales narrow and long. Apophyses posteriores about twice length of anterior ones. Sterigma subtrapezoid with proximal margin almost straight or slightly arched, distal margin covered with some bristles, also present around ostium bursae. Ostium oval. Colliculum long, chaliced. Ductus bursae with in distal part medial line as long as half the ductus, and small spinose section about as long as half the sterigma; anterior part of ductus transparent, coiled. Bursa copulatrix round, signum a small, elongate patch covered with round spines (fig. 95).

The female genitalia also show some slight individual variation, mainly in the shape of the sterigma and of the colliculum (figs. 101, 103-106).

Diagnosis. — *C. crypsineura* belongs to the 30th group of Toll's system, and is close to *C. leucocephala*, from which it can be distinguished by the following characteristics: in the male of *crypsineura* the ventral margin of the sacculus is more curved, while the lateral margin is wider, oblique and less serrated. The cornuti are more numerous, united into a longer formation. In the female genitalia of *crypsineura* the sterigma is shorter with a wider base, the colliculum is shorter as well as the spinose segment of the ductus bursae, which has a shorter and weaker medial line.

Biology. — Unknown.

Distribution. — Dry and semidry southern Australia from Coonabarabran, New South Wales, to Caiguna, western Australia.

Coleophora tremefacta Meyrick
(figs. 6, 26, 107-113)

Coleophora tremefacta Meyrick, 1921b: 472. Holotype ♂ 'Adelaide, Largs Bay, O.L., 2.20' (SAMA) [not examined].

— Paratype ♀ 'Largs Bay, S.Australia, OL. 2.20', 'tremefacta Meyr.', 'Paratype *Coleophora tremefacta* Meyr. 1921, det.I.F.B.Common', '*Coleophora tremefacta* Meyr., E.Meyrick det., in Meyrick coll.', 'B.M. Genitalia Slide ♀ 24462' (BMNH) [examined].

Material examined. — 1 ♂, 'Queensland, T.P.L./95', det. E.Meyrick, (slide BMNH 24466) (BMNH). This specimen was determined by Meyrick after the description of *tremefacta*. The external features resemble those of the paratype ♀ which is kept in the BMNH, but, since both specimens are in poor condition (wings with few scales) characterization of the species is thus tentative.

According to the original description the holotype is in the Lower Collection, which is kept at the SAMA; unfortunately I have not been able to study that specimen, for in the Museum of Adelaide there is, at the moment, no profession-

al lepidopterist who can look for the types among the material in the collection.

Description. — The original description by Meyrick is clear. When examining the two specimens kept in the BMNH I could ascertain that the description fits them well; however, these are worn specimens and better material will be needed for a more comprehensive description.

Male genitalia of the specimen kept in the BMNH (slide BMNH 24466) (fig. 107). — Spinose part of gnathos big, globular. Tegumen constricted at base of gnathos arms, with sclerotized 'Y'; pedunculi long and curved. Transtilla wide and oval. Valvula small, with rounded sclerotized ventral margin. Cucullus large, compact, ear-shaped. Sacculus, curved and oblique, ventrally with narrow lateral margin, apex dentate. Phallotheca with two arched rods, shorter one ended acutely, longer one with small apical tooth. Cornuti (fig. 109) 3-4, of different lengths, one much longer than the others, curved, and almost the full length of the vesica, other cornuti positioned at base of long one.

Structure of abdominal supports (figs. 110, 113). — No posterior lateral struts. Transverse strut slender, somewhat convex. Tergal disks about 3 times longer than wide (3rd tergite) covered with short conical spines.

Female genitalia (fig. 111). — Papilles anales very narrow and long, heavily sclerotized. Apophyses posteriores about twice length of anterior ones. Sterigma (fig. 112) heavily chitinized, subtrapezoid, with both margins concave. Ostium small, ogival. Colliculum narrow, chaliced. Distal part of ductus bursae about twice length of sterigma, almost transparent except for lateral reinforcement; spinose section about 3.5 times longer than sterigma, recurved with medial line extended into coiled portion of ductus, proximal portion of ductus speckled with chitine and coiled. Bursa copulatrix almost rounded, with leaf-shaped signum and smaller suboval signum covered with small spines.

Diagnosis. — *C. tremefacta* belongs to the 30th group of Toll's system in the section of *versurella*. The differences in the genitalia are: in the male of *tremefacta* (specimen BMNH 24466) the transtilla is shorter and more oval, the cucullus is shorter and more compact; the cornuti are different because they are not divided into two formations. In the female the papilles anales are more sclerotized, just like the sterigma, which is much broader; the colliculum is narrower and longer; and the spinose section of the ductus bursae begins closer to the colliculum than in *versurella*.

Biology. — Unknown.

Distribution. — Coastal regions of South Australia, north of Adelaide.

Coleophora nielseni sp. n.

(figs. 15, 30, 114-117)

Type material. — Holotype: ♀, Brisbane, 3.11.02, [A. J. Turner], slide ANIC 2372 (ANIC). Paratypes 3 specimens, all without abdomen before dissection: 1 ex., Brisbane, 23.ii.02, [A. J. Turner]; 1 ex., Brisbane, 21.xi.02, [A. J. Turner]; 1 ex., Brisbane; *Batrachedra hypoxutha* Meyr. (ANIC).

Note. — All specimens were mixed in the type series of *Batrachedra hypoxutha* Meyrick, 1897 (ANIC), which, according to the original description, consisted of three specimens. Actually the type series of *hypoxutha* comprises two specimens of the true *hypoxutha*, from which Schmidt-Nielsen has selected a lectotype.

Description. — The original description by Meyrick of his *Batrachedra hypoxutha* might have been based upon the specimen that is now the object of the description of *C. nielseni* sp. n., for they correspond very well. In any case I give here a new description. Wingspan 11 mm. Head (fig. 15), thorax and abdomen light ochreous. Head white laterally and dorsally of the eyes. Palpi almost completely covered with ochreous scales, darker at external margin: second segment about 1.5 times longer than third. Antennae: basal segment without scale-tuft, ochreous except for white upper surface, flagellum ringed white and ochreous. Forewings glossy ochreous, gradually variegated from dorsum to costa, the latter white. Fringes grey-beige. Hindwings light grey; fringes beige.

Female genitalia (fig. 114). — Papilles anales oval, very small. Apophyses posteriores about 2.5 times longer than anterior ones. Sterigma narrow (fig. 115), subtrapezoid, anterior margin arched, posterior margin convex, with some short bristles, excavated in middle at ostium bursae. Ostium ogival. Colliculum well sclerotized, in the form of deep cup. Ductus bursae: distal section to colliculum transparent except for two symmetrical reinforcements along external margin, and with medial line extended to half length of ductus. Spinose section about 1.5 times longer than sterigma, section cephalad curved and transparent with medial line; in the central section the ductus is curved, speckled with chitine; bursa copulatrix oval, signum narrow, elongate, covered with triangular spines.

Structure of abdominal supports (fig. 117). — No posterior lateral struts; transverse strut slender, slightly convex. Tergal disks covered with small spines, narrower base. Disks of 3rd tergite about 3.5 times longer than wide.

Diagnosis. — *C. nielseni* belongs to the 30th group of Toll's system, perhaps to the *versurella* section; more precise placement is not possible because the

male is unknown. The female genitalia can easily be distinguished from those of *versurella* by the sterigma, which is narrow and long; the spinose section of the ductus bursae, which is shorter; and the signa, because *nielseni* is without a leaf-like signum.

Biology. — Unknown.

Distribution. — Southern Queensland.

Derivation of name. — The species is dedicated to Dr. Ebbe Schmidt-Nielsen, with thanks for the opportunity he has given me to realize this paper.

Coleophora horakae sp.n.

(figs. 11, 31, 118-129)

Type material. — Holotype: ♂, Toowoomba, Q., 1.iv.16, [A. J. Turner]; slide ANIC 2314 (ANIC); Paratypes: 1♀ (slide ANIC 2379), Goodna, Q., 25.i.49, I. F. B. Common; 1♀ (slide ANIC 2373), Glen Innes, NSW, 25.iii.13, [A. J. Turner]; 1♀ (slide ANIC 2319), Black Mt., ACT, Light Trap, 22 Jan. 1961, I. F. B. Common; 1♀ (slide ANIC 2309), 23.38S 133.53E, Todd River, 9 km NbyE of Alice Springs, NT, 10 Oct. 1978 (ANIC).

Description. — Wingspan 10 mm. Head (fig. 11) light brown, except for sides above eyes. Labial palps almost completely white on inside and light brown on outside, except base and dorsal part of second segment white, second segment about 1.5 times shorter than first. Antennae: basal segment uniformly ochreous, without scales tuft; flagellum ringed ochreous and greyish-white. Thorax and abdomen light brown. Forewings pearly ochreous, with slender greyish-white line along costa, gradated, terminated before fringes. Fringes beige. Hindwings light brown; fringes beige.

Male genitalia (fig. 118). — Spinose part of gnathos big, globular. Tegumen constricted at base of gnathos arms, pedunculi laterally prominent. Transtilla short, rounded and dorsally widened. Valvula small, oblique and ventrally long. Cucullus compact, ear-shaped. Sacculus narrow, with external margin rounded and strongly curved, ended apically with two obtuse teeth of irregular shape. Phallotheca rods symmetrical, distally tapered, with apices rounded and curved. About 10 cornuti, of different lengths, united into a cluster about as long as vesica.

Structure of abdominal supports (figs. 121, 125). — No posterior lateral struts. Transverse strut, slightly convex, with complete proximal margin, distal margin not sclerotized in middle. Tergal disks about 4 times longer than wide (3rd tergite) with small conical spines.

Female genitalia (fig. 122). — Papilles anales small, narrow and long. Apophyses posteriores about twice length of anterior ones. Sterigma (figs. 126-129) ir-

regularly trapezoid, with proximal margin almost straight and distal margin convex, with some bristles; distal margin excavated in middle at ostium bursae. Ostium ogival. Colliculum amphora-shaped. Ductus bursae with medial line in distal half, spinose section about as long as sterigma; proximal half of ductus speckled with chitine, and with a few coils. Signum a small elongate plate covered with triangular spines (figs. 123, 124).

Diagnosis. — *C. horakae* belongs to group 30 of Toll's system and may be placed in the section of *therinella* Tngstr. The male genitalia can be distinguished mainly by the structure of the lateral margin of the sacculus, which does not end in a big, sharp process as in *therinella*, and by the completely different phallotheca, which is simpler and symmetrical. The female genitalia differ from all others in the group, mainly by the shape of the colliculum, which is amphora-shaped, and by the presence of a single signum, irregular and not of the usual leaf-like shape.

Biology. — Unknown.

Distribution. — Southern Queensland, tablelands of New South Wales to central Australia.

Derivation of name. — The species is dedicated to Dr. Marianne Horak, with thanks for all the help she has given me with the realisation of this paper.

Coleophora fuscospquamata sp.n.

(figs. 10, 28, 130-132)

Type material. — Holotype: ♀, 26.03S 127.14E, 66 km EbyN of Warburton, WA, 15 Nov. 1977, M. S. Upton; slide ANIC 2356 (ANIC). Paratypes: 2♀ (slide ANIC 2357), as holotype; 1♀ (slide ANIC 2348), 24.58S 129.23E, Hull River 33 km ESE of Docker River, NT, 17 Nov. 1977, M. S. Upton (ANIC).

Description. — Wingspan 8-9 mm. Head (fig. 10) white, dorsally covered with ochreous scales. Labial palps white on inner side; second segment about 1.5 times longer than third, outside traversed by brown longitudinal band; third segment ventrally brown. Antennae: basal segment ochreous, dorsally white; flagellum ringed white and brown. Thorax and abdomen ochreous. Forewings ground colour white, with longitudinal streak of ochreous and dark brown scales below costa from base to apex. Fringes beige. Hindwings and fringes beige. It should be noted that the tibiae of this species are unusually coloured for a Coleophoridae: they are white, on the outside traversed by a central longitudinal line, slender, brown.

Female genitalia (fig. 130). — Papilles anales small, oval. Apophyses posteriores about twice length of anterior ones. Sterigma (fig. 131) rather sclerotized, strongly convex on proximal margin and slightly less on distal one; ostium small, oval, little pronounced.

Colliculum large, shaped like elongated funnel. Ductus bursae with medial line along about 2/3rd of its length; distal section of ductus, about 1/3rd of its total length, covered with spines, proximal section, gradually widened into bursa copulatrix. Bursa large, oval, signum a small oval chitinous plate speckled with small spines.

Structure of abdominal supports (fig. 132). – No posterior lateral struts; transverse strut, slightly convex, with complete proximal margin, distal margin more slender in middle part. Tergal disks, with short conical spines, 2.5 times longer than wide (3rd tergite).

Diagnosis. – The species belongs to the 30th group of Toll's system; only the female is known, so presently it is not possible to give a more precise placement in the system. The very characteristic shape of the sterigma enables it to be distinguished easily.

Biology. – Unknown.

Distribution. – Central Australia near border between Western Australia and Northern Territory.

Coleophora frustrata sp. n.

(figs. 13, 32, 133-136)

Type material. – Holotype: ♂, 2.7 km NE of Queanbeyan, NSW, 670 m, 3 Oct. 1972, I. F. B. Common; slide ANIC 2342 (ANIC).

Description. – Wingspan 8 mm. Head (fig. 13), thorax and abdomen ochreous. Labial palps white; second segment about twice length of third, covered with ochreous scales on outer side over much of its surface, third segment ochreous on inner side only. Antennae: basal segment with a short tuft of brown scales brown, except for dorsal side white; flagellum ringed white and brown, except for first basal segments ventrally brown and dorsally white. Forewings pearly ochreous; a thin white line along costa, gradually narrowing. Fringes beige. Hindwings and fringes beige.

Male genitalia (fig. 133). – Spinose part of gnathos big, globular. Tegumen constricted at base of gnathos arms. Transtilla oval, elongated. Valvula small, narrow, teardrop-like shaped. Cucullus ear-shaped, slightly elongated. Sacculus with vertical lateral margin, ended in triangular point at ventral angle, and sharper point at dorsal angle. Phallotheca slightly curved and long, consisting of two rods, longer rod tapered to acute apex, shorter rod 2/3rd of length of other with wider beak-like apex. About ten needle-like cornuti, united into long cluster (fig. 135).

Structure of abdominal supports (fig. 136). – No posterior lateral struts; transverse strut with curved proximal margin, distal margin straight, not sclerotized in middle. Tergal disks with small conical

spines, about 2.5 times longer than wide (3rd tergite).

Diagnosis. – The new species belongs to the 30th group of Toll's system; however, the female is unknown, so it is difficult to relate it to another species. In coloration it resembles *C. horakae* sp. n. very much, but the male genitalia are markedly different.

Biology. – Unknown.

Distribution. – Southern tablelands of New South Wales.

Coleophora rustica sp. n.

(figs. 12, 33, 137-140)

Type material. – Holotype: ♂, 23.59S 133.56E, 32 km SbyE of Alice Springs, NT, 23 Sept. 1978, E. D. Edwards; slide ANIC 2351 (ANIC).

Description. – Wingspan 11 mm. Head (fig. 12), thorax and abdomen pearly ochreous. Labial palps ochreous; ventral part of second segment about twice length of third. Antennae: basal segment without scales tuft ochreous, dorsal surface white; flagellum ringed white and ochreous, except for basal segments entirely ochreous. Forewing almost uniformly ochreous, slightly variegated, with brilliant sheen, with some brown scales. Fringes greyish ochreous. Hindwings greyish beige; fringes beige.

Male genitalia (fig. 137). – Spinose part of gnathos globular. Tegumen constricted medially, with wide and rounded pedunculi. Transtilla elongated, oval. Valvula narrow, elongated, teardrop-shaped, oblique on external margin. Valva compact, ear-shaped. Sacculus rounded on ventral margin, ended in subtriangular, obtuse point at ventral angle; lateral margin straight, ended in acute tooth at dorsal angle. Phallotheca slightly arched and long, with two rods, longer rod curved, acute at apex, beak-shaped, shorter rod ended in triangular point. Cornuti 4-5 (fig. 139), needle-like, of different lengths, united into long cluster.

Structure of abdominal supports (fig. 140). – No posterior lateral struts; transverse strut characterized by convex proximal margin, thicker in middle, distal margin almost straight. Tergal disks with short, conical spines on wide base, about 3 times longer than wide (3rd tergite).

Diagnosis. – *C. rustica* belongs to the 30th group of Toll's system, and as the female is not known it is difficult to give a more precise placement in the system. As far as the Australian fauna is concerned, it is close to *C. frustrata*, from which it can be distinguished by the following characteristics of the male genitalia: in *rustica* the pedunculi as well as the cucullus are wider; the ventral margin of the sacculus is more curved, while the lateral margin is not concave, but slightly convex; the processes at the two angles are different;

the phallotheca rods are wider and the longer one ends in a beak, which is absent in *C. frustrata*.

Biology. — Unknown.

Distribution. — Central Australia.

Coleophora albiradiata sp. n.

(figs. 16, 27, 141-154)

Coleophora ochroneura.— sensu Common 1990.

Type material. — Holotype: ♂ (slide ANIC 2363), Black Mt, ACT, Light Trap, 17 Jan. 1961, I. F. B. Common (ANIC). Paratypes: 1♂ (slide ANIC 8769) same label as holotype, 2. Nov. 1959 [the photograph of this specimen was reproduced in the volume by Common 1990, with the name of *C. ochroneura* Lower]; 1♀ (slide ANIC 2343), Rockhampton, 2.5.48, I. F. B. Common; 1♂ (slide H 53), Brisbane, 7.iv.10, [A. J. Turner]. 1♀ (slide ANIC 2355), Brisbane, 10.iii.16; 1♂ (slide ANIC 2333), Warwick, Q., Oct.; 1♀ (slide ANIC 2310), Milmerran, Q., 20.ix.31; 1♂ (slide ANIC 2336), 85 miles W of Wanaaring, NSW, emg. 5 Nov. 1949, I. F. B. Common; Larva on *Rutidosis helichrysoides* [Asteraceae]; 2♂ (slide ANIC 2361), 1♀ (slide ANIC 2362), Depor Beach, 10 miles NE of Bateman's Bay, NSW, 13 Mar 1970, 21 Mar. 1969, I. F. B. Common; 1♀ (slide ANIC 2335), 2.7 km NE of Queanbeyan, NSW, 670 m, 18 Apr. 1974, I. F. B. Common; 6♂ (slides ANIC 2371, 2322, 2321, 2365, 2318), 3♀ (slides ANIC 2366, 2320, 2364), as holotype but 9 Apr. 1963, 29 Oct. 1959, 6 Nov. 1959, 3 Apr. 1963, 18 Jan. 1961, 2 Nov. 1959, 17 Dec. 1963, 18 Oct. 1959, 18 Sept. 1963; 1♂ (slide ANIC 2337), 1 km SSE of Srivener Dam, ACT, 13.iii.1985, E. D. Edwards; 1♀ (slide ANIC 2330), 24.15S 133.26E, James Ranges, NT, 22 Sept. 1978, E. D. Edwards; 2♀ (slides ANIC 2312, 2311), 24.11S 134.01E, 56 km SbyE of Alice Springs, NT, 3 Oct. 1978, E. D. Edwards; 1♂ (slide ANIC 2352), 23.41S 134.15E, 39 km E of Alice Springs, NT, 25 Sept. 1978, E. D. Edwards (ANIC).

Description. — Wingspan 9.5-10.5 mm. Head (fig. 16) light brown. Labial palps white; second segment, about twice length of third, almost completely brown on outer side, third segment brown only on ventral side. Antennae: basal segment brown with scale tuft; flagellum ringed white and brown. Thorax brown with white and brown tegulae. Abdomen beige. Forewings ochreous with white streaks along costa, dorsum and main veins. Fringes beige. Hindwings and fringes beige. The colour of the wings and the width of the streaks is variable, and in the female the colour is usually lighter.

Male genitalia (fig. 141). — Spinose part of gnathos

oval. Tegumen constricted medially, pedunculi of average length. Transtilla narrow, elongated, rounded at apex. Valvula small, subtriangular, covered with bristles. Cucullus big, compact, ear-shaped. Sacculus with curved ventral margin, with long process in shape of curved and sharp horn at dorsal angle extended to middle of cucullus. Phallotheca with two long and symmetrical rods, rounded at apex, more sclerotized on dorsal side. Cornuti 2-3 (fig. 139) rather small, united into needle-like cluster.

Structure of abdominal supports (figs. 140, 154). — No posterior lateral struts; transverse strut with proximal margin thicker than distal one. Tergal disks with small conical spines; those of 3rd tergite about 6 times longer than wide.

Female genitalia (fig. 150). — Papilles anales small, oval, speckled with chitine. Apophyses posteriores about 2.5 times longer than anterior ones. Sterigma (fig. 151) irregularly trapezoid, uniformly sclerotized, with convex proximal margin and curved distal margin, with some bristles, excavated medially at ostium bursae. Ostium small, ogival. Colliculum chaliced, completely transparent, except for well-sclerotized section lining ostium bursae. Ductus bursae entirely transparent, except for sclerotized disk with small spines (figs. 152, 153) at insertion of ductus seminalis. Bursa copulatrix small, oval, without signa.

Diagnosis. — *C. albiradiata* belongs to the 30th group of Toll's system, and according to its genital structures could be placed in the section of *C. chrysanthemi* Hofmann (fig. 149), together with *C. absinthivora* Baldizzone, *C. kurokoi* Oku (fig. 148) and *C. yomogiella* Oku (fig. 147), species that use Asteraceae for hostplants. The most closely related species is *C. yomogiella* Oku, distributed in Japan, China and Korea. The most obvious differences in the genitalia are: in the male of *albiradiata* the cucullus is wider, the sacculus ends in the dorsal angle in a more acute process without a tooth at the base. In the female genitalia of *albiradiata* the distal margin of the sterigma is more rounded; the ductus bursae is shorter, completely transparent, also without the medial line which is present in *yomogiella*; the bursa has no signum, while *yomogiella* has a small one.

Note. — Common (1990) treated this species under the name of *C. ochroneura* (Lower), also presenting a photograph of a specimen (fig. 24.10) and a drawing of the male genitalia (fig. 83.3, 4). Evidently he had not studied the type of *ochroneura*.

Biology. — One of the specimens that I studied had been bred from *Rutidosis helichrysoides* DC: this species belongs to an endemic genus in the tribe *Inuleae* of the Asteraceae. *Rutidosis* is a plant of drier habitats. Unfortunately the larval case has not been preserved and there is no other biological information associated with the specimen. It should be noted that

owing to the fact that the species has also been collected in Java it must also live on another plant species.

Distribution. – Southern Queensland, coastal New South Wales to central Australia.

Coleophora consumpta sp. n.
(figs. 14, 29, 155–158)

Type material. – Holotype: 1♂, 31.22S 131.47E, 14 km NNW of Yalata Mission, SA, 9 Apr. 1983, E. S. Nielsen, E. D. Edwards; slide ANIC 2360 (ANIC).

Description. – Wingspan 9 mm. Head (fig. 14), thorax and abdomen beige. Labial palps white: second segment about twice length of third, with wide brown band on outer side, third variegated white and beige. Forewings weakly and uniformly ochreous, with some brown scales. Fringes beige. Hindwings light brown; fringes beige.

Male genitalia (fig. 155). – Spinose part of gnathos globular. Tegumen constricted at base of gnathos arms, pedunculi widened laterally. Transtilla narrow and elongate, slightly widened and rounded at apex. Valvula irregularly shaped, rounded on ventral margin. Cucullus shaped like elongate ear, not extended beyond sacculus. Sacculus narrow, elongate, with long and rounded process laterally, ended dorsal angle with triangular tooth. Phallotheca long and almost straight with two rods, apex of longer rod slightly curved and sharp, beak-like, apex of shorter rod divided into two asymmetrical sharp points. Two needle-like cornuti of different lengths (fig. 157).

Structure of abdominal supports (fig. 158). – No posterior lateral struts; transverse strut almost straight, proximal margin thicker. Tergal disks with short conical spines, about 2.5 times longer than wide (3rd tergite).

Diagnosis. – *C. consumpta* belongs to the 30th group of Toll's system; its precise placement is uncertain, as the female is not known. The male genitalia show no resemblance to any Australian species.

Biology. – Unknown.

Distribution. – East of Nullarbor Plain.

CONCLUSIONS

The study of the Coleophoridae of Australia has resulted in rather interesting information, and above all, it can give indications leading to an understanding of the evolution of this extensive family; so far no cladistic work has been produced on this family. First of all one is struck by the small number of specimens in Australia, compared with what we know of the Palaearctic region (more than 1000 species, of which about 400 for Europe (Baldizzone 1995). The genus

Corythangela is transferred from the family Coleophoridae to the Batrachedridae.

Of the 14 Australian species of the genus *Coleophora* only *C. alcyonipennella* can be considered a species introduced by man. *C. serinipennella* was thought to be an indigenous species (Common 1990), however, its very wide distribution can only be explained by accepting accidental transport. The phenotypical variation of this species that occurs in Australia (a form with brown streaks) could be explained by a very rapid reaction to the environment. *C. serinipennella* is the only representative of its group (Toll's 8th) in Australia, while the other species (except *alcyonipennella*) belong to Toll's 30th group: *C. seminalis*, *C. leucocephala*, *C. crypsineura*, *C. tremefacta*, *C. nielseni*, *C. horakae*, *C. fuscosquamata*, *C. frustrata*, *C. rustica*, *C. consumpta*, *C. albiradiata*. When examining the habitus of these species, the uniformity of their dimensions is striking, for all specimens have a wingspan of 8 to 11 mm.; a similar uniformity can be found in the colour of the forewings, which is always limited to ochreous, white, brown etc. Based on the wing markings the species can be divided into two groups: one characterized by almost uniformly ochreous forewings, with an indistinct white line along the costa and sometimes some brown scales (*C. nielseni*, *C. horakae*, *C. rustica*, *C. frustrata*, *C. consumpta*, *C. tremefacta*); the other with white or beige wings, streaked more or less regularly with brown or ochre (*C. seminalis*, *C. albiradiata*, *C. leucocephala*, *C. crypsineura*, *C. fuscosquamata*). Another very interesting feature in species whose female is known is the absence of a leaf-like or anchor-shaped signum, so characteristic for Coleophoridae. Only *C. tremefacta* has one, small, leaf-like signum, together with another signum which is elongate, irregular, speckled with small spines; that signum is also present in *C. leucocephala*, *C. nielseni*, *C. horakae*, *C. fuscosquamata*, whereas *C. albiradiata* has no signa. This signum is typical of a group of species that includes, for example, *C. versurella*, which in addition has a typical Coleophorid signum. Another interesting feature is the structure of the phallus complex, which is, in all species except *C. serinipennella*, characterized by two 'juxta rods', according to the nomenclature of Landry (1993); the presence of two rods might represent a primitive characteristic (Landry in litt.), while the fusion of the rods, which can be observed in numerous Palaearctic species (also in *alcyonipennella*), could represent an advanced feature. The structure of the genitalia of most of the species, all belonging to the group of *C. versurella* (which is not known from Australia) could indicate that *C. versurella* and the Australian species have a common ancestor, which has given rise to a significant subdivision in Australia. Moreover, the phallotheca of *C. serinipennella* is rather simple

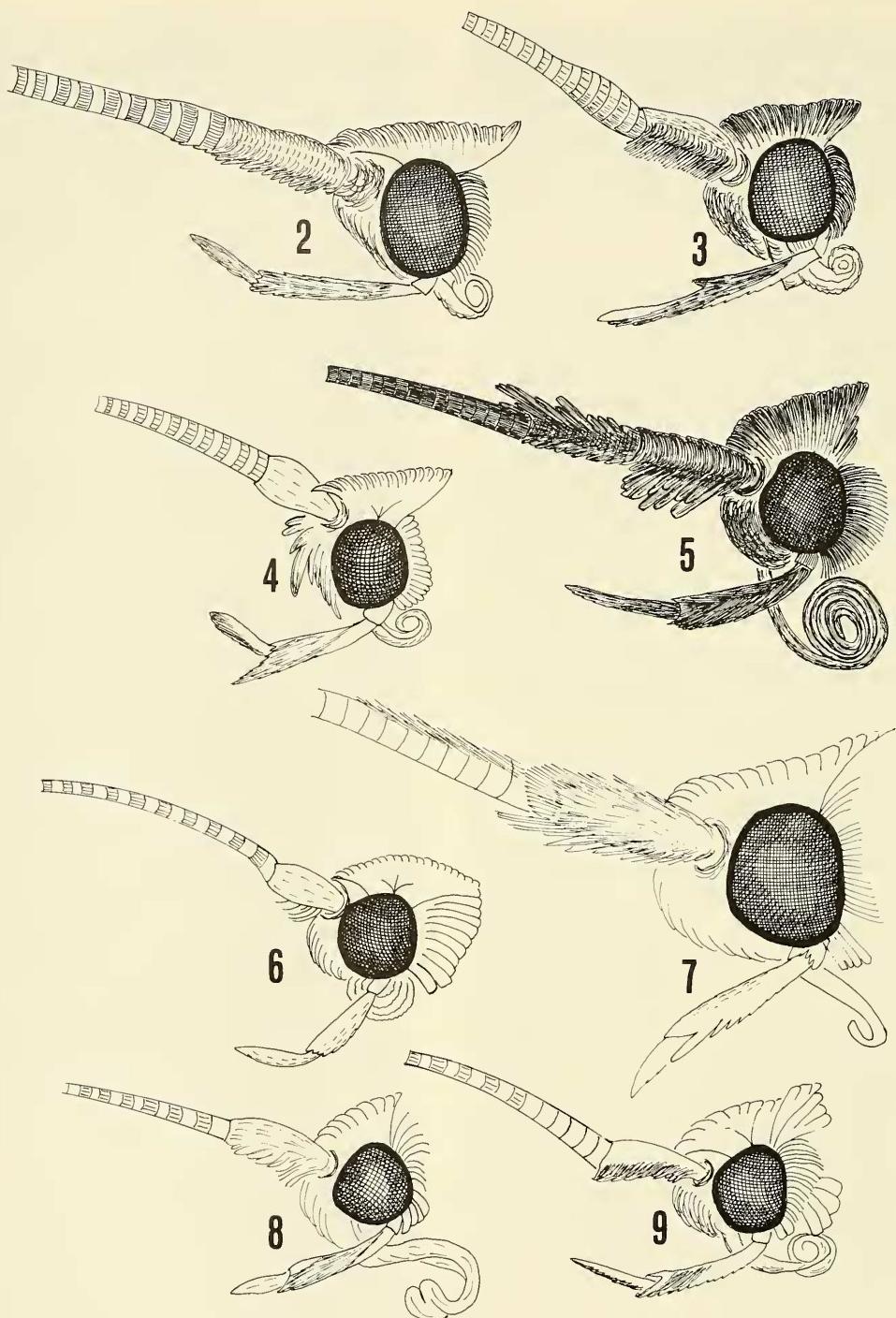
and the 'juxta rods' are very different; one rod is almost atrophic, while the other shows all the chitinous reinforcement of the 'phallus complex'; this could indicate a different line of evolution. If the view that this species has been imported accidentally into Australia is accepted, the consequence is that all indigenous Australian species so far known have two juxta rods.

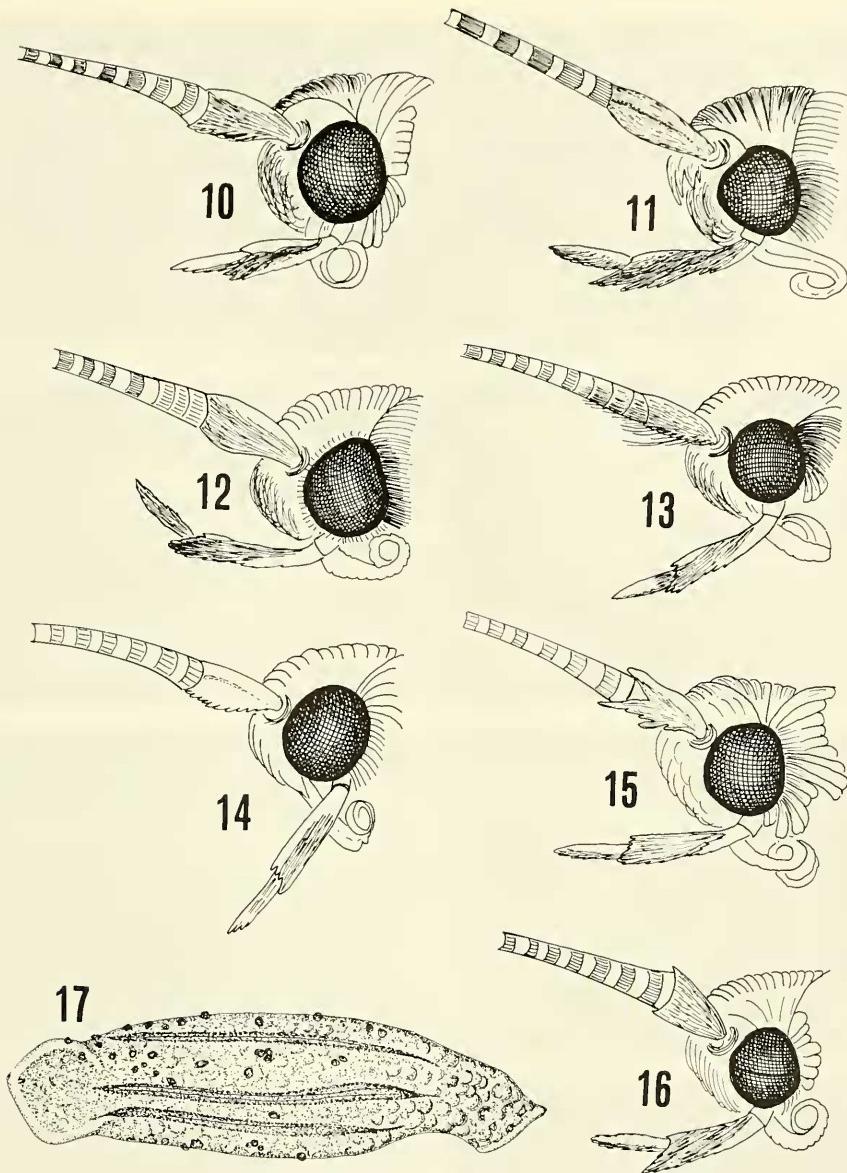
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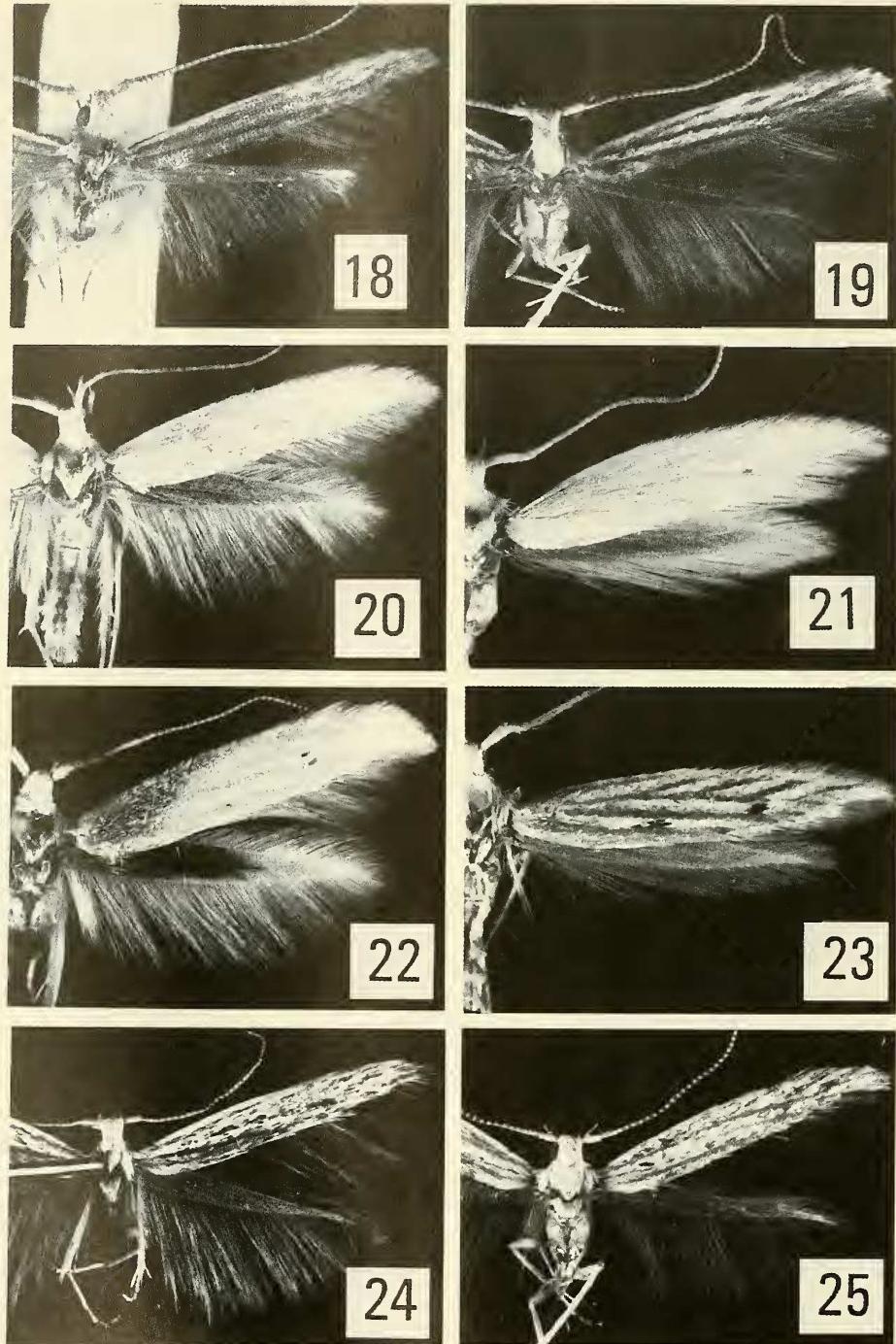




Figs. 10-16. Heads of *Coleophora*. 10, *C. fuscquamata* sp. n., 11, *C. horakae* sp. n., 12, *C. rustica* sp. n., 13, *C. frustrata* sp. n., 14, *C. consumpta* sp. n., 15, *C. nielseni* sp. n., 16, *C. albiradiata* sp. n. – Fig. 17. Larval case of *C. seminalis* Meyrick.

Left

Figs. 2-3. Heads of *Corythangela*. 2, *C. galeata* Meyrick, 3, *C. fimbriata* sp. n. – Figs. 4-9. Heads of *Coleophora*. 4, *C. seminalis* Meyrick, 5, *C. alcyonipennella* (Kollar), 6, *C. tremefacta* Meyrick, 7, *C. serinipennella* Christoph, 8, *C. leucocephala* sp. n., 9, *C. crypsineura* (Lower).



Figs. 18-19. *Corythangela* spp. 18, *C. galeata* Meyrick, 'Sydney, N.S.Wales, 9/12/77', Paralectotype 4/9, 19, *C. fimbriata* sp. n., holotype. - Figs. 20-25. *Coleophora* spp. 20, *C. serinipennella* Christoph, 'Australia, 25 miles E of Eucla, W.A., 19 Mar. 1968, I.F.B.Common & M.S.Upton', 21, idem, '10 mi. NE by E of Iron Knob, S.A., 23 Oct. 1968, Britton, Upton, Balderson', 22, idem, 'Madura, W.A., 20 Mar. 1968, I.F.B.Common & M.S.Upton', 23, idem, 'Australia, Drummond Cove, 11 km N of Geraldton, W.A., 26 Apr. 1973, N.Mc Farland', 24, *C. leucocephala* sp. n., holotype, 25, *C. crypsineura* (Lower).



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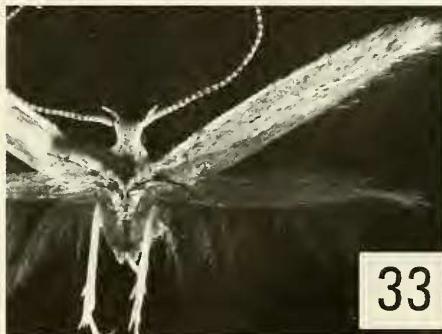
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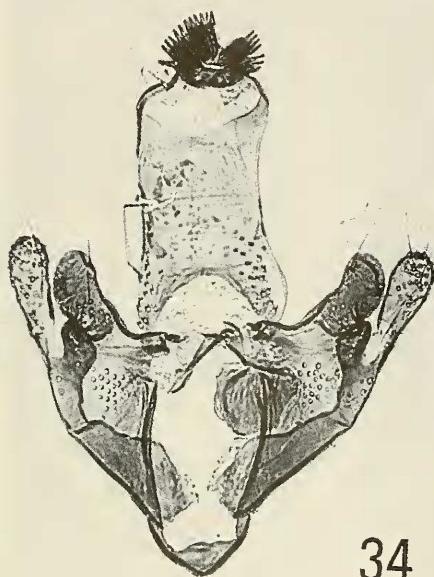


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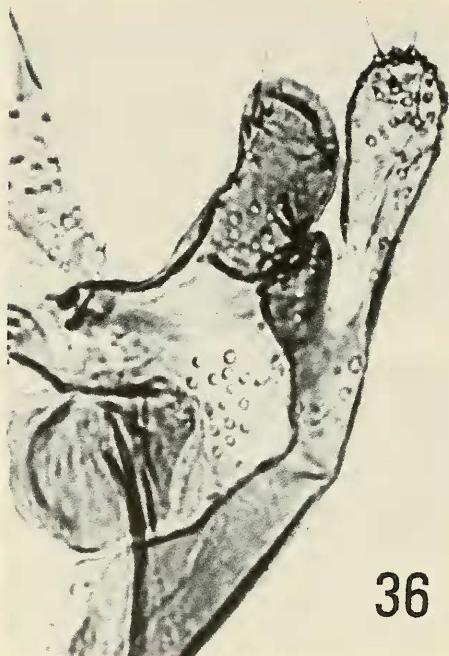


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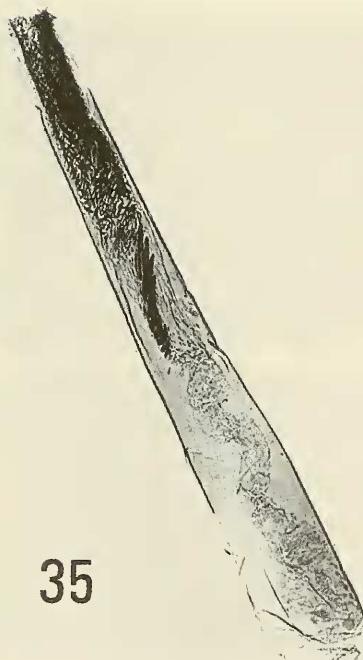
Figs. 26-33. *Coleophora* spp. 26, *C. tremefacta* Meyrick, paratype, 27, *C. albiradiata* sp. n., holotype, 28, *C. fuscosquamata* sp. n., paratype, 29, *C. consumpta* sp. n., holotype, 30, *C. nielseni* sp. n., holotype, 31, *C. horakae* sp. n., paratype, 32, *C. frustrata* sp., holotype, 33, *C. rustica* n. sp., holotype.



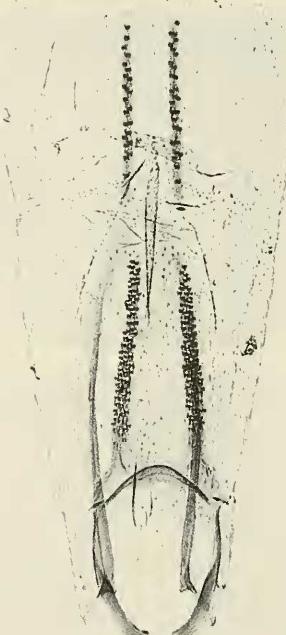
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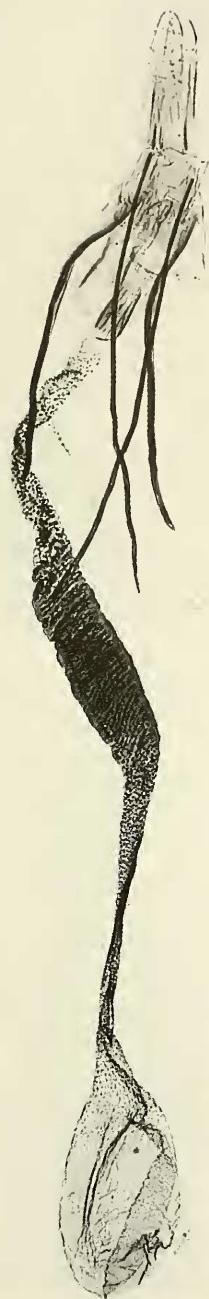
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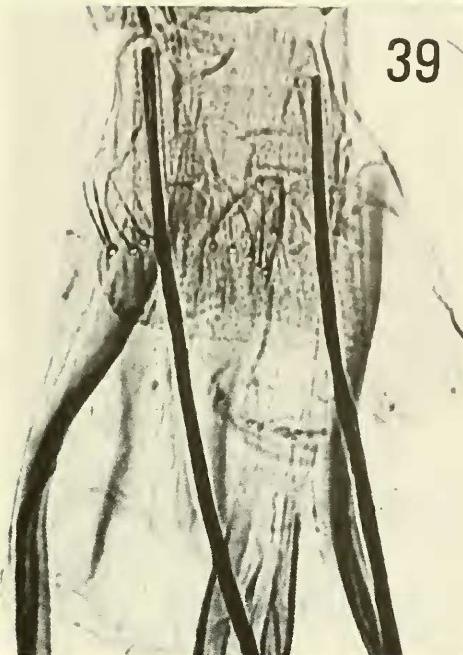
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Figs. 34-37. *Corythangela galeata* Meyrick, slide ANIC 2317. 34, male genitalia, 35, aedeagus, 36, detail of genitalia at high magnification, 37, abdomen.

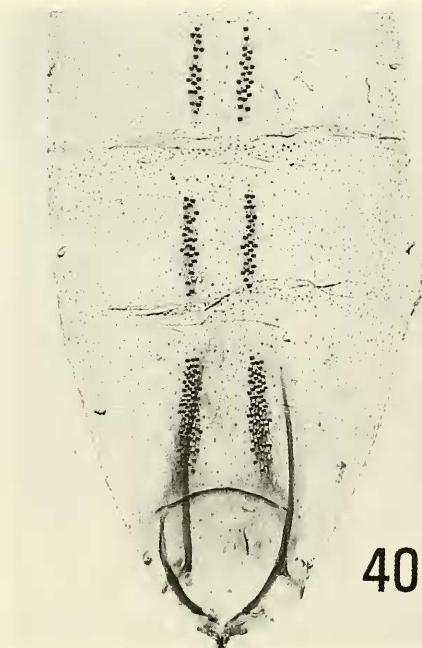
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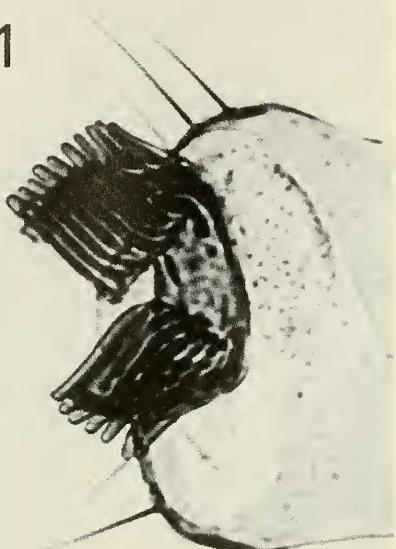


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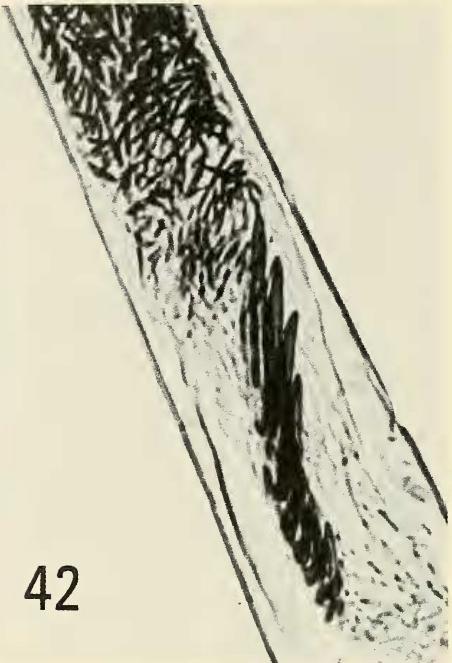


Figs. 38-40. *C. galeata* Meyrick, slide BMNH 24463, 38, female genitalia, 39, sterigma at high magnification, 40, abdomen.

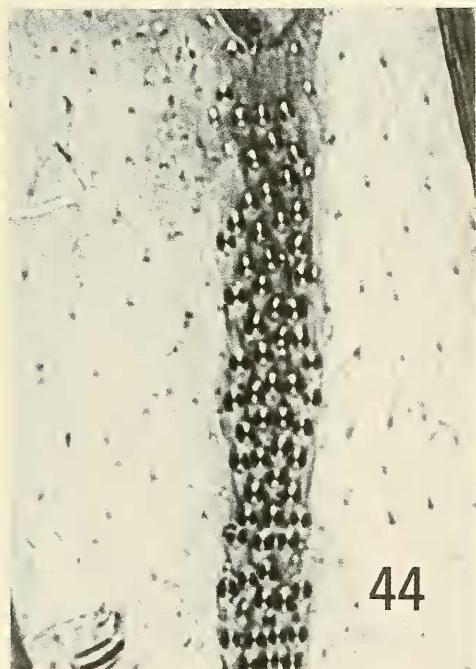
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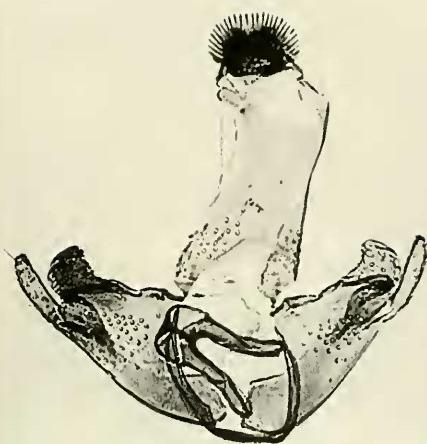


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Figs. 41-44. *C. galeata* Meyrick, 41, male genitalia, detail of distal part of the gnathos, at high magnification, slide BMNH 24450, 42, male genitalia, detail of cornuti at high magnification, slide ANIC 2317, 43, female genitalia, detail of ductus bursae at high magnification, slide BMNH 24463, 44, abdomen, detail at high magnification of tergal disk, slide BMNH 24450.

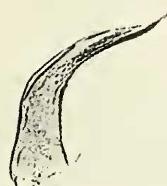
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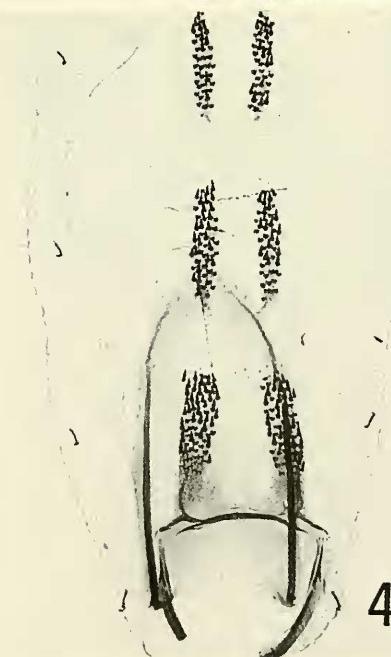
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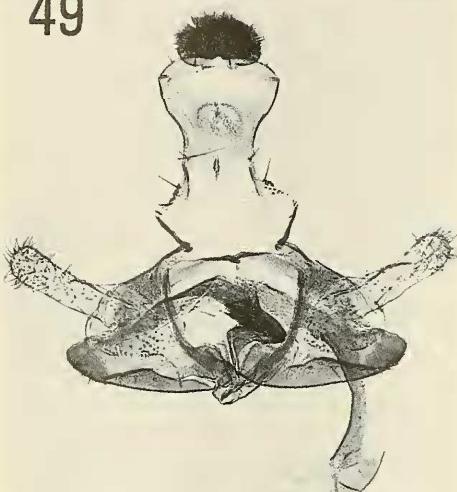


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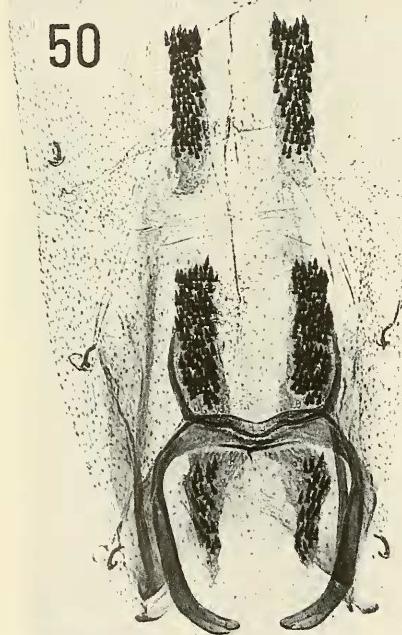


Figs. 45-48. *C. fimbriata* sp. n., holotype, slide ANIC 2341, 45, male genitalia, 46, aedeagus, 47, detail of genitalia at high magnification, 48, abdomen.

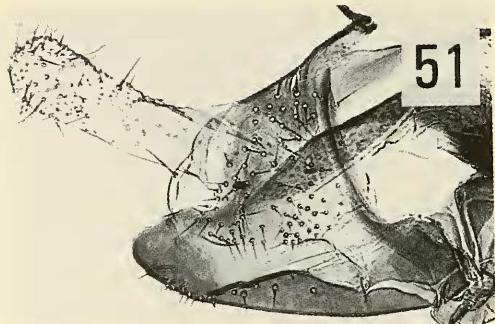
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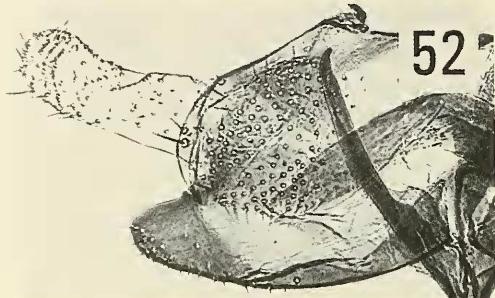
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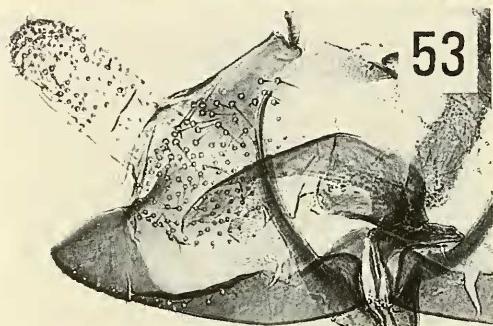
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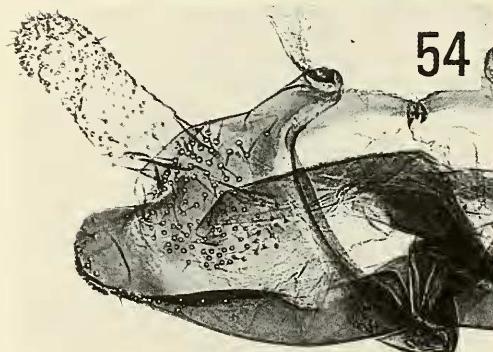
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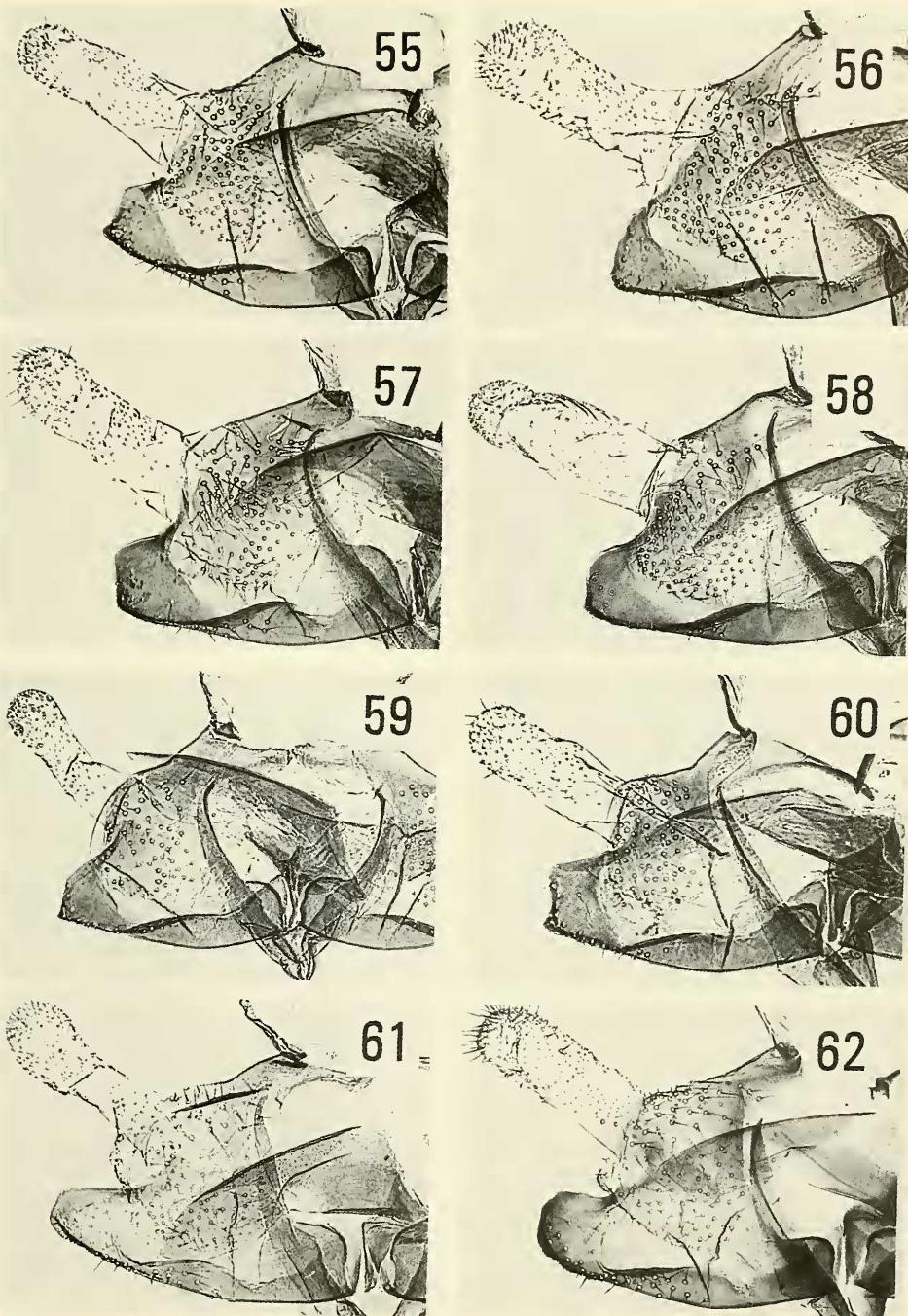
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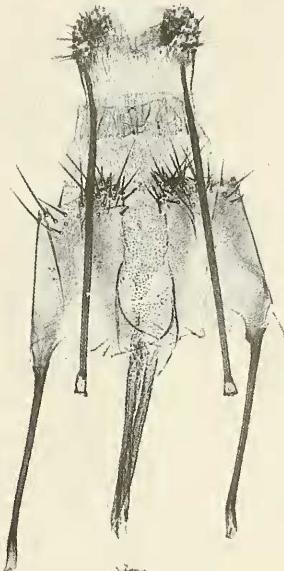


Figs. 49-54. *C. serinipennella* Christoph, male genitalia, 49, slide ANIC 2296, 50, abdomen, 51, detail of genitalia at high magnification, 52, detail, slide ANIC 2304, 53, detail, slide ANIC 2306, 54 slide Bldz 9187, lectotype of *C. pudica* Lower.

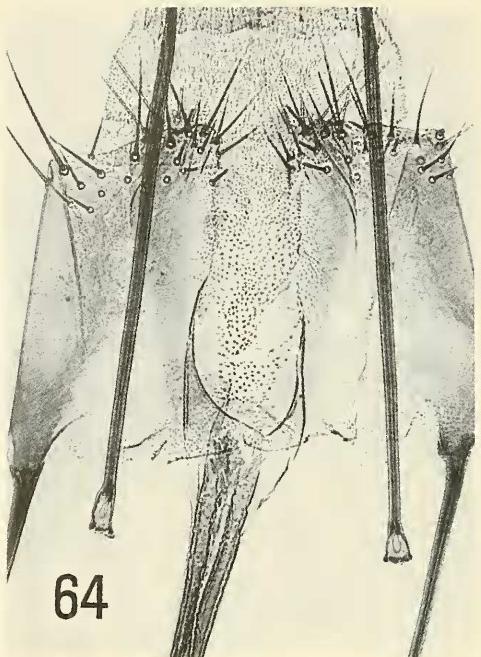


Figs. 55-62. *C. serinipennella* Christoph, male genitalia, detail at high magnification, 55, slide ANIC 2300, 56, slide ANIC 2308, 57, slide Bldz 9186, holotype of *Cochroneura* Lower, 58, slide ANIC 2297, 59, slide Bldz 9188, paralectotype of *C. pudica* Lower, 60, slide Bldz 9189, paralectotype of *C. pudica* Lower, 61, slide Bldz 6811 'Japan, Kyūshū-Wakamatsu (Chikuzen), 20.VI.1932, I. Tateishi', coll. USNM, 62, slide Bldz 1837 'Algérie, Biskra, 29.V.1907, leg. Chrétien', coll. MNHN.

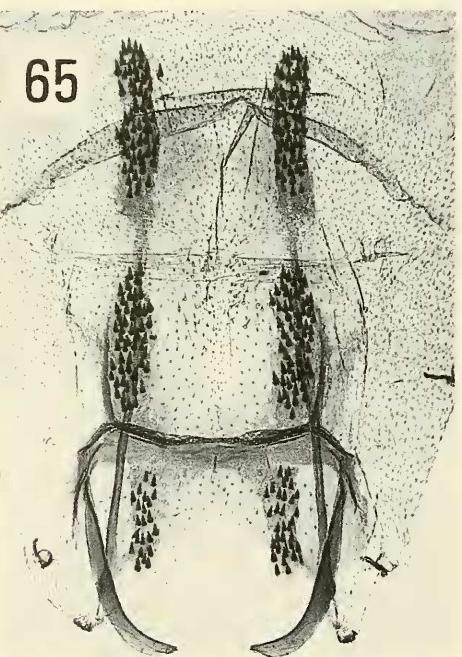
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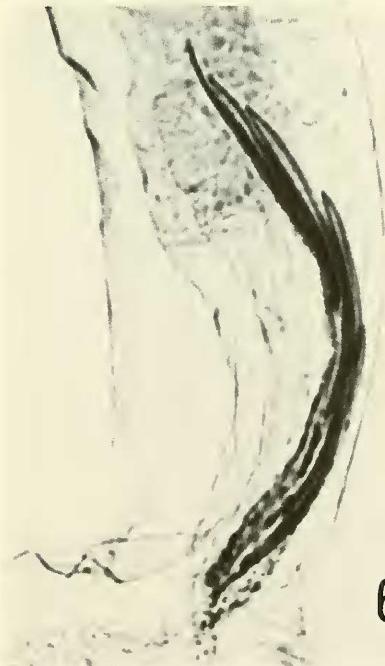
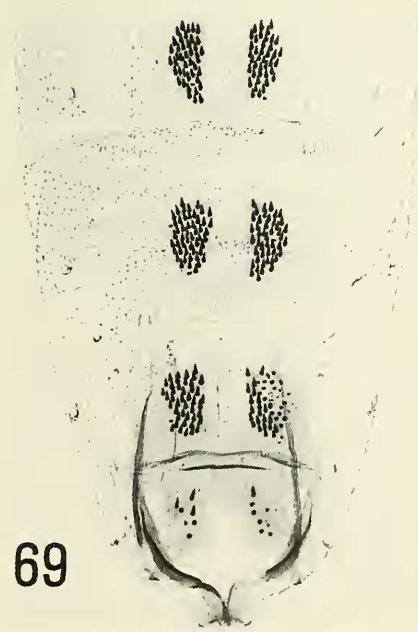
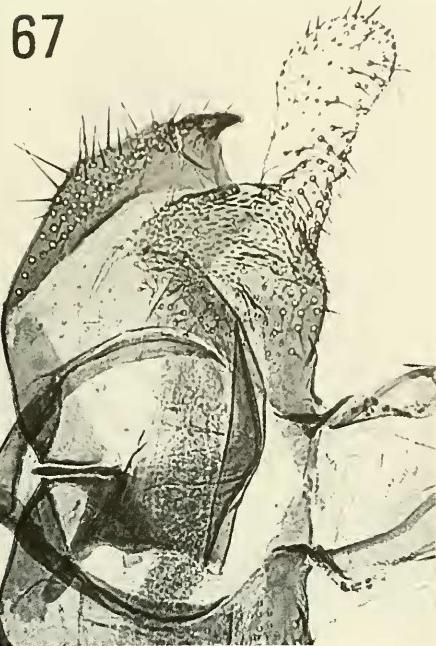
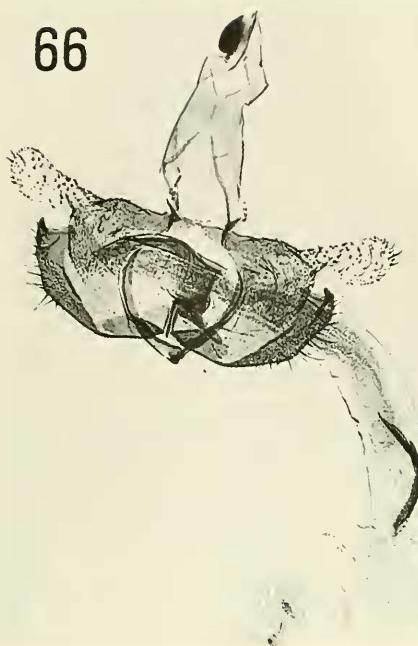
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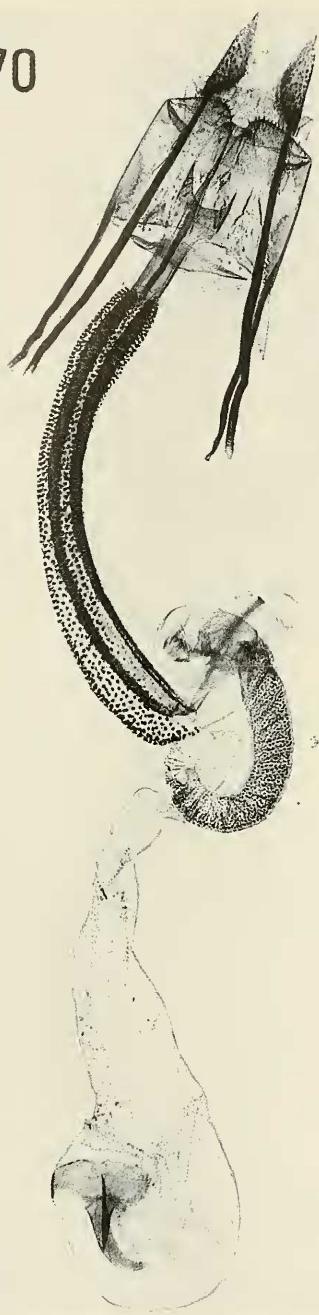


Figs. 63-65. *C. serinipennella* Christoph, slide ANIC 2298, 63, female genitalia, 64, sterigma at high magnification, 65, abdomen.

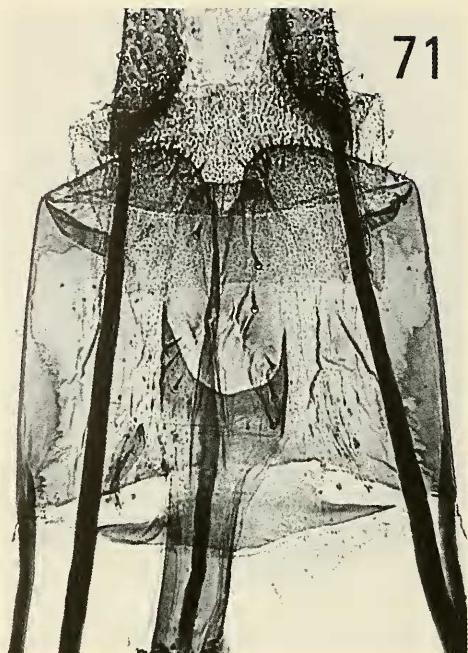


Figs. 66-69. *C. alcyonipennella* (Kollar), slide ANIC 2325, 66, male genitalia, 67, detail of genitalia at high magnification, 68, cornuti at high magnification, 69, abdomen.

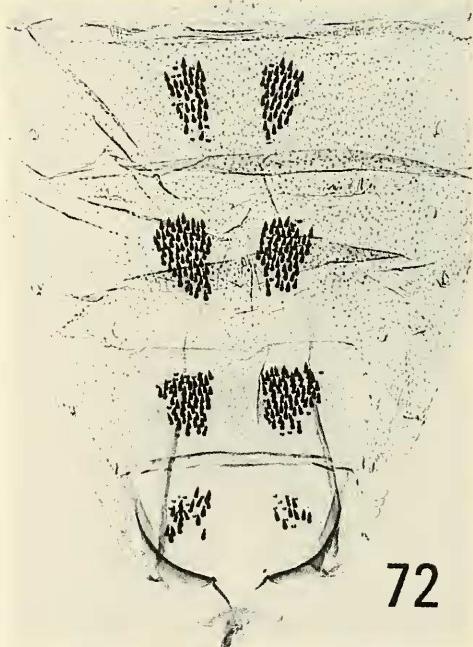
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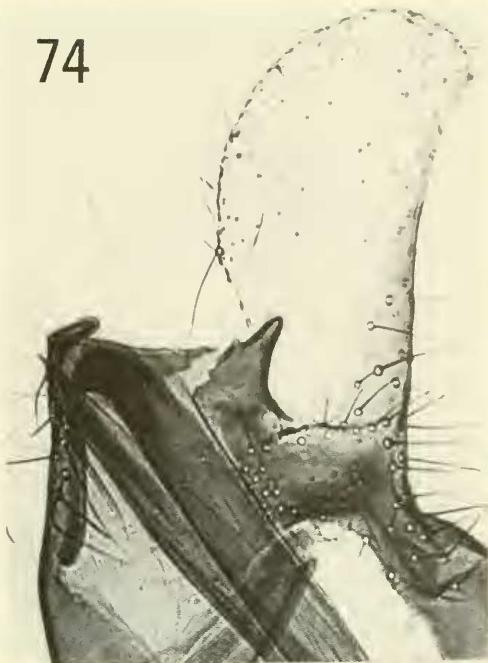


Figs. 70-72. *C. alcyonipennella* (Kollar), slide ANIC 2376, 70, female genitalia, 71, sterigma at high magnification, 72, abdomen.

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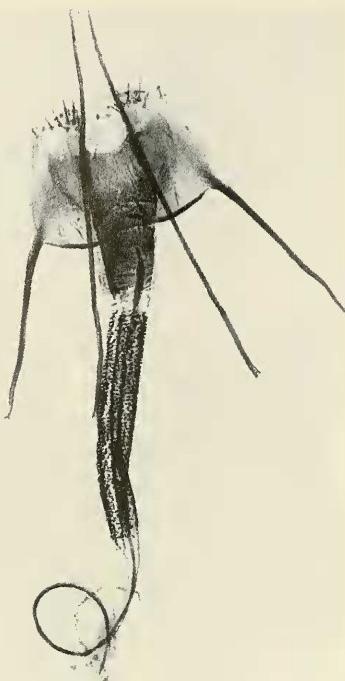


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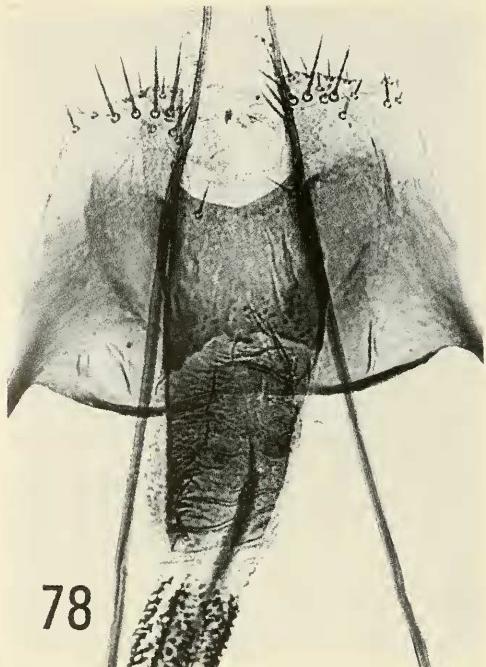


Figs. 73-76. *C. seminalis* Meyrick, slide ANIC 2331, 73, male genitalia, 74, detail of genitalia at high magnification, 75, corona at high magnification, 76, abdomen.

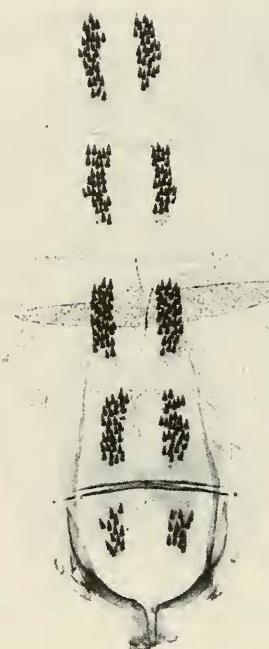
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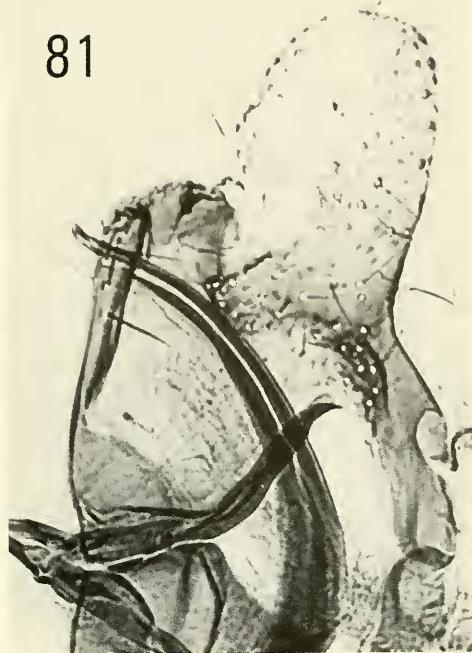


Figs. 77-79. *C. seminalis* Meyrick, slide ANIC 2332, 77, female genitalia, 78, sterigma at high magnification, 79, abdomen.

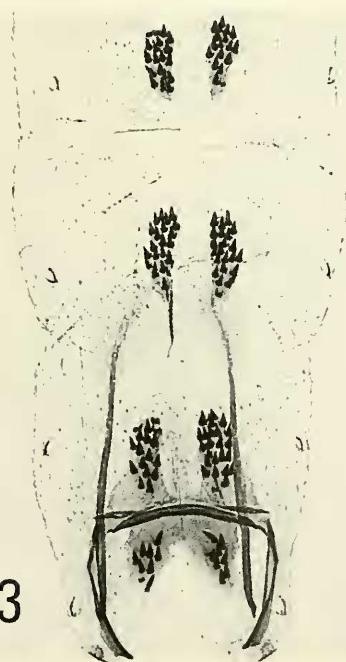
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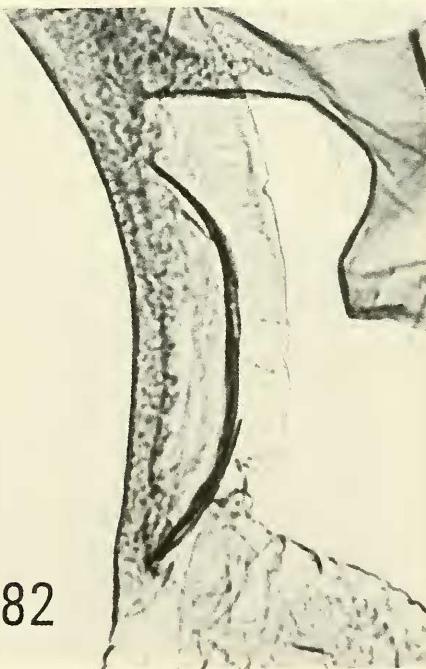
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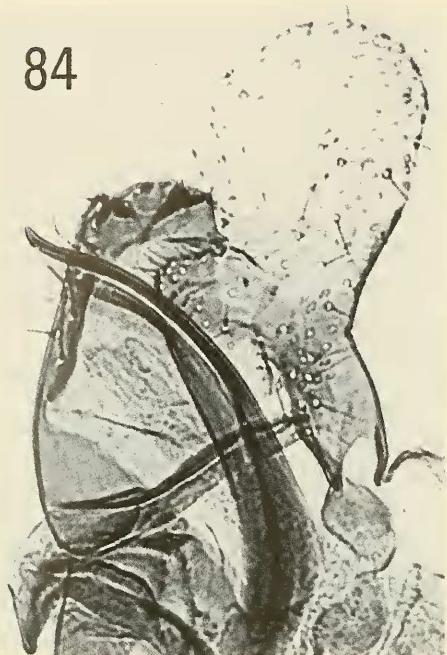


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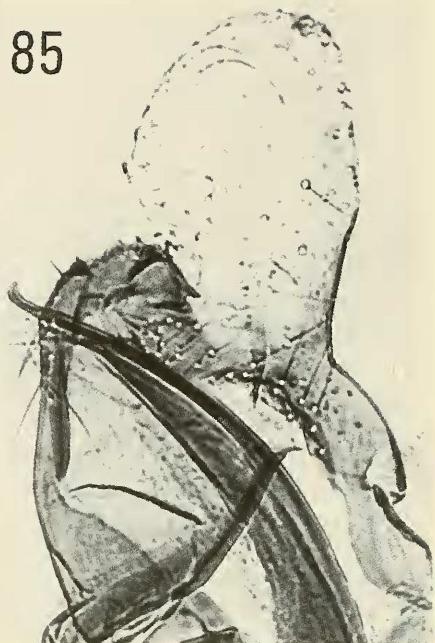


Figs. 80-83. *C. leucocephala* sp. n., slide ANIC 2346, 80, male genitalia, 81, detail of genitalia at high magnification, 82, coriuli at high magnification, 83, abdomen.

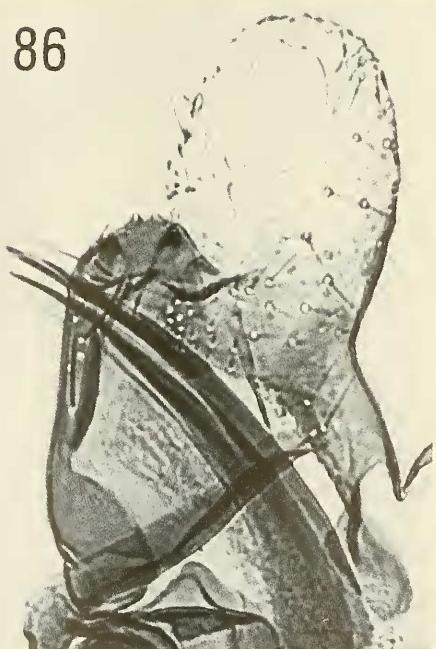
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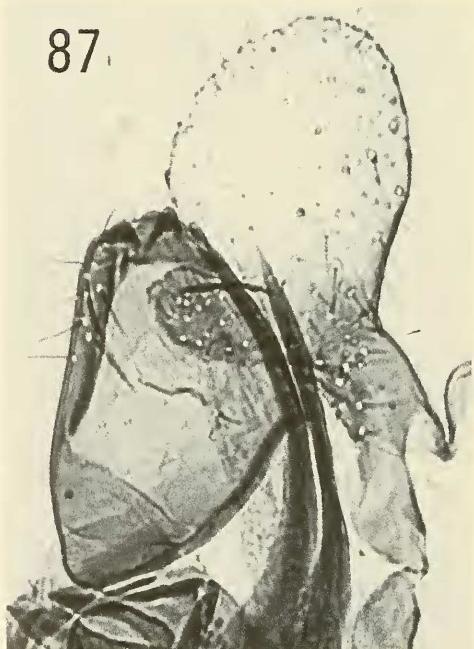
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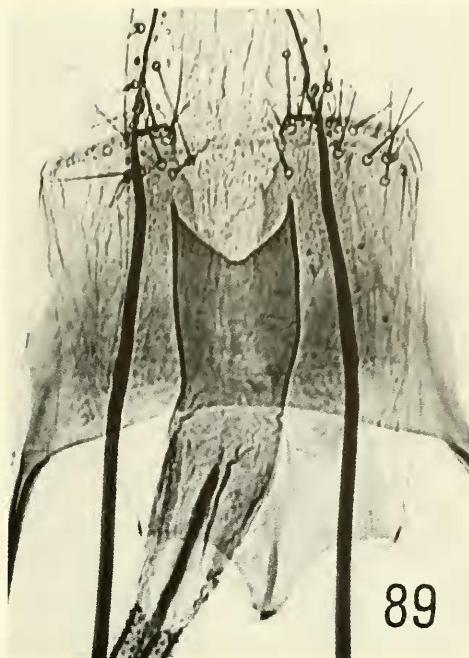
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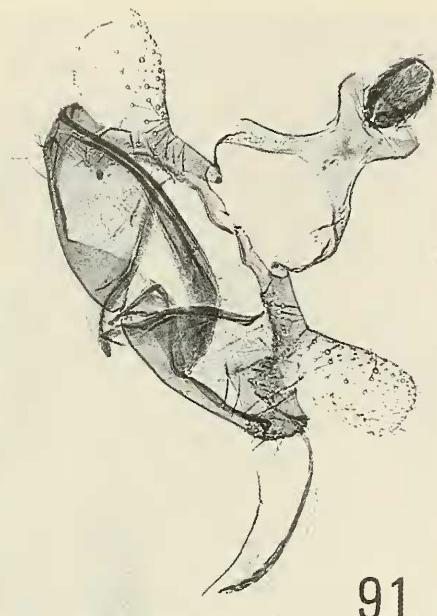
87



Figs. 84-87. *C. leucocephala* sp. n., detail of male genitalia at high magnification, 84, slide ANIC 2370, 85, slide ANIC 2349, 86, slide ANIC 2345, 87, slide ANIC 2340.



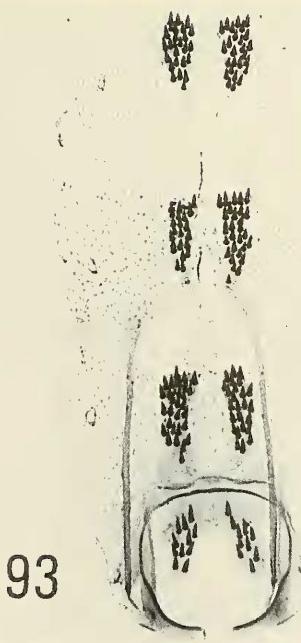
Figs. 88-90. *C. leucocephala* sp. n., slide ANIC 2350, 88, female genitalia, 89, sterigma at high magnification, 90, abdomen.



91



92



93



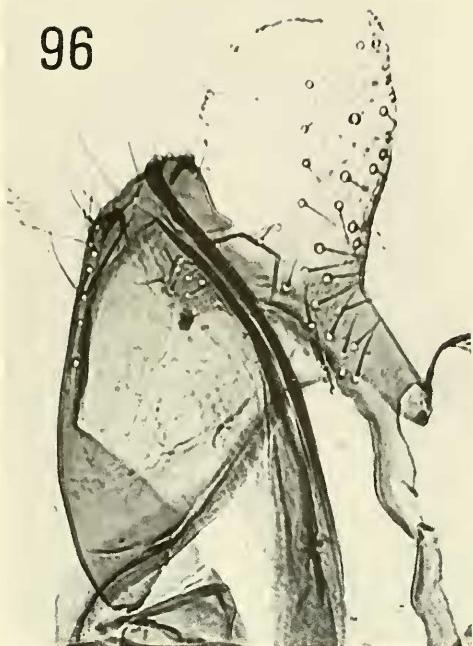
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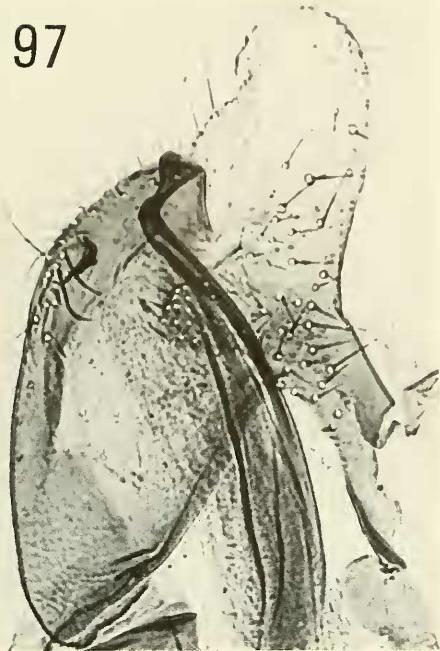


Figs. 91-93. *C. crypsineura* Lower, slide ANIC 2334, 91, male genitalia, 92, cornuti at high magnification , 93, abdomen.
Figs. 94-95. *C. crypsineura* Lower, female genitalia, 94, slide Bldz 9190, lectotype, signum at high magnification, 95, slide Bldz 9192, paralectotype, signum at high magnification.

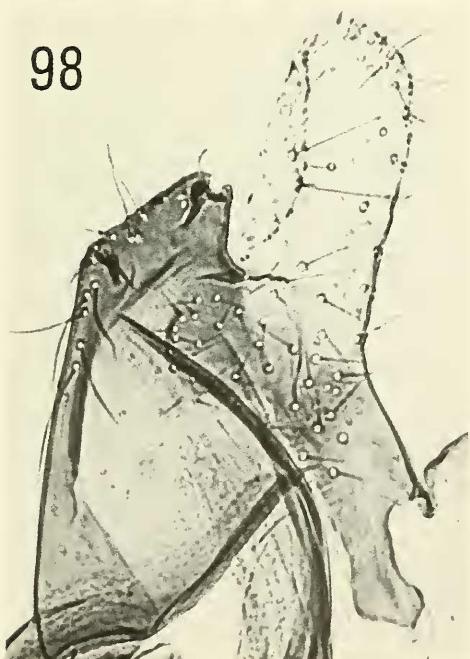
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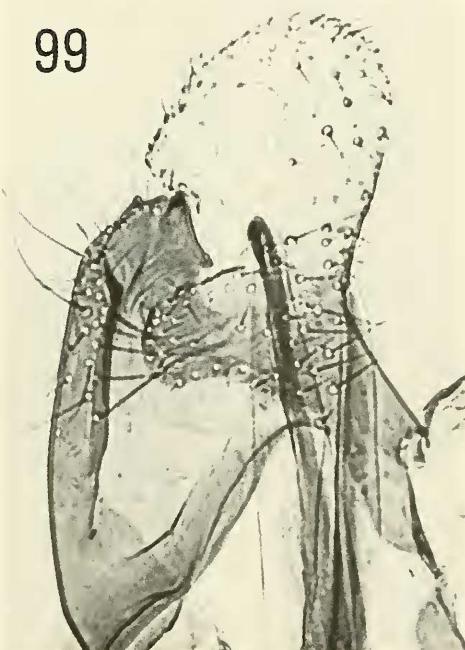
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98

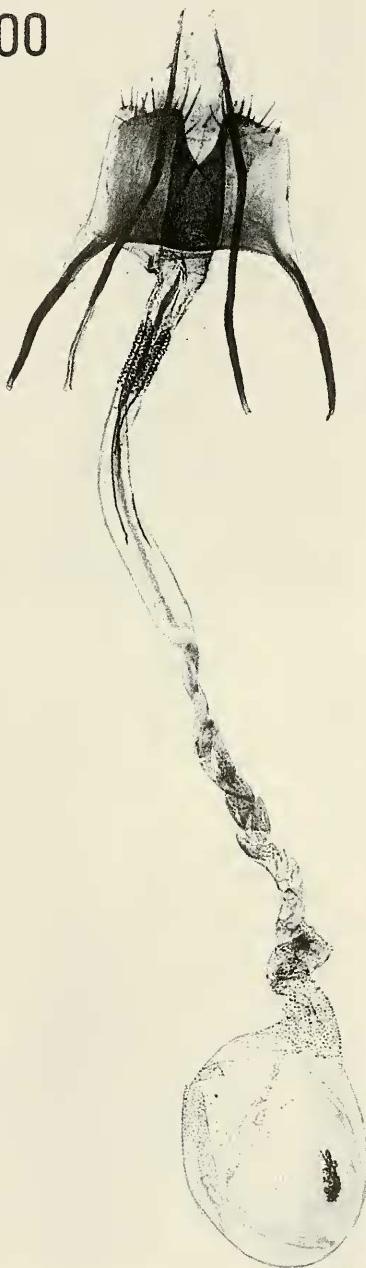


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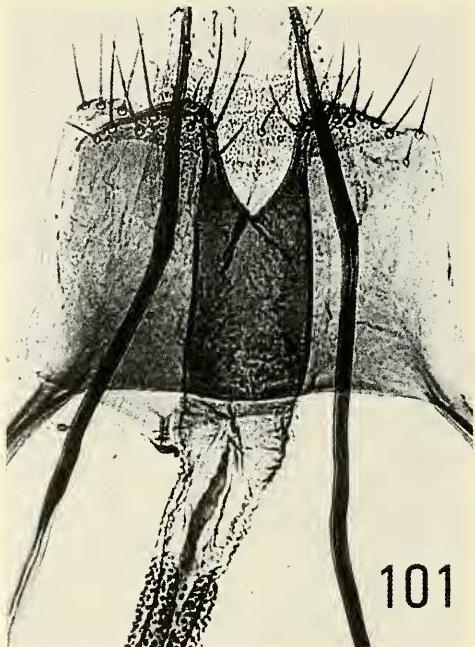


Figs. 96-99. *C. crypsineura* Lower, detail of male genitalia at high magnification, 96, slide ANIC 2334,
97, slide ANIC 2358, 98, slide ANIC 2329, 99, slide ANIC 2339.

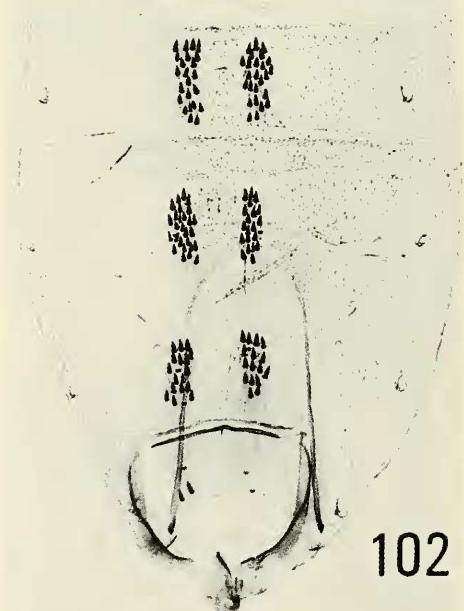
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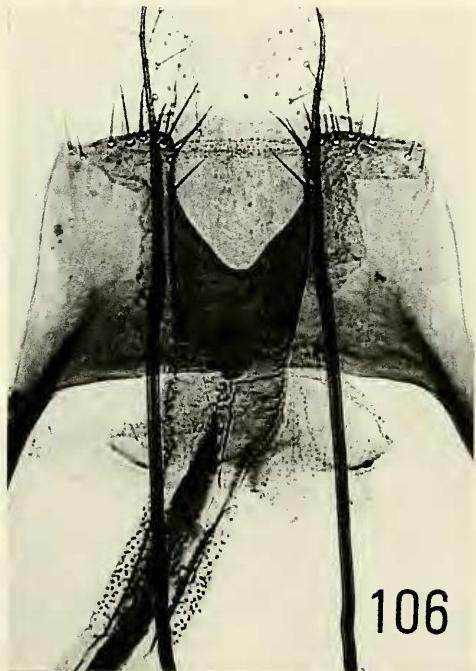
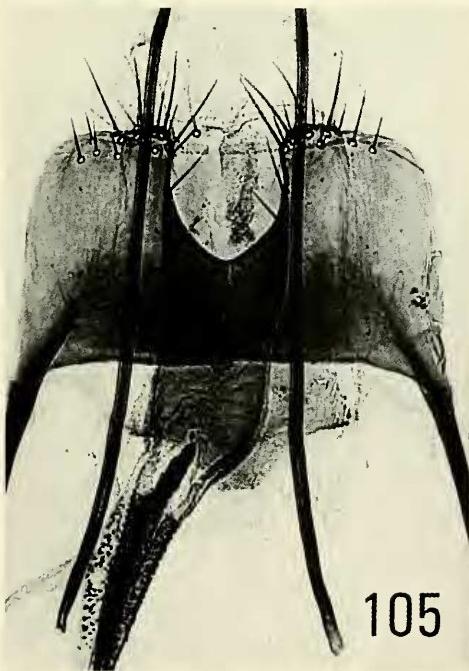
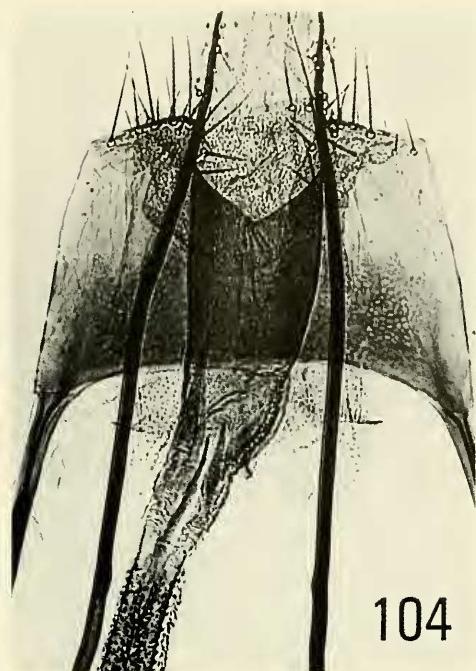
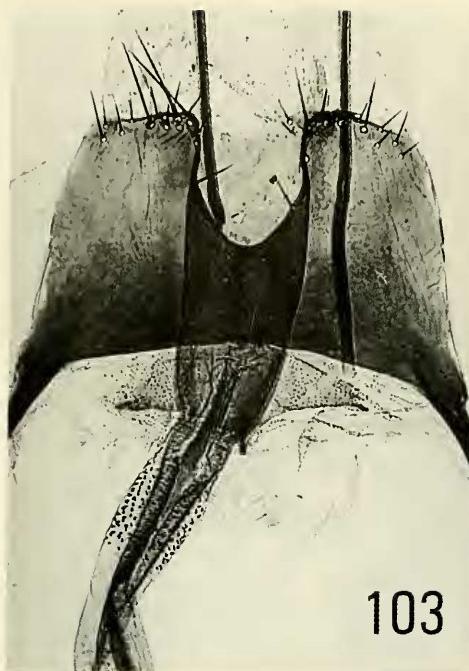
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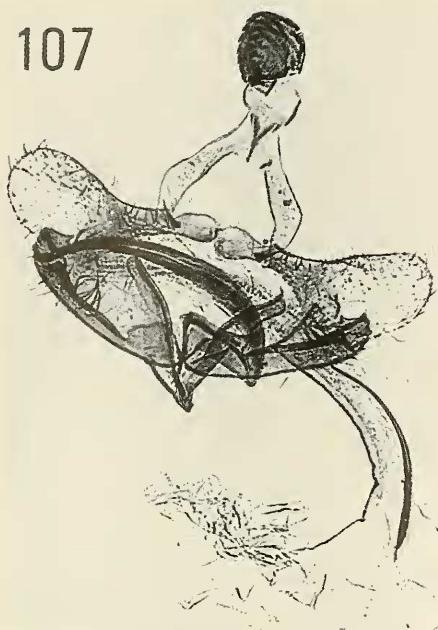


Figs. 100-102. *C. crypsineura* Lower, slide ANIC 2359, 100, female genitalia, 101, sterigma at high magnification, 102, abdomen.

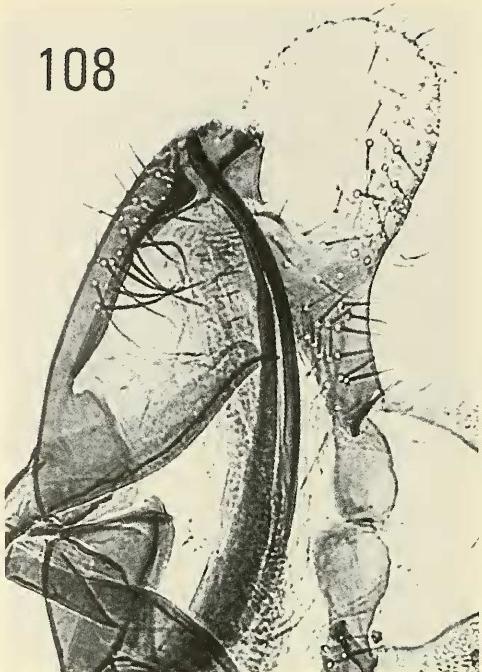


Figs. 103-106. *C. crypsineura* Lower, female genitalia, sterigma at high magnification, 103, slide Bldz 9190, 104, slide ANIC 2369, 105, slide ANIC 2315, 106, slide ANIC 2338.

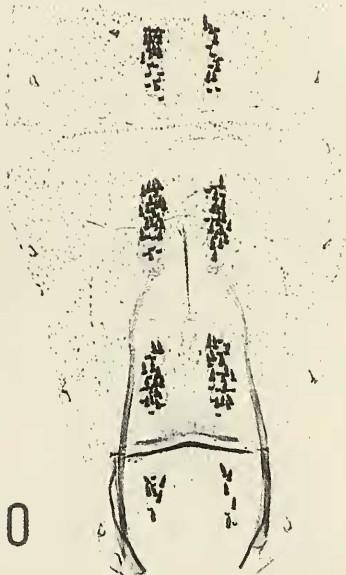
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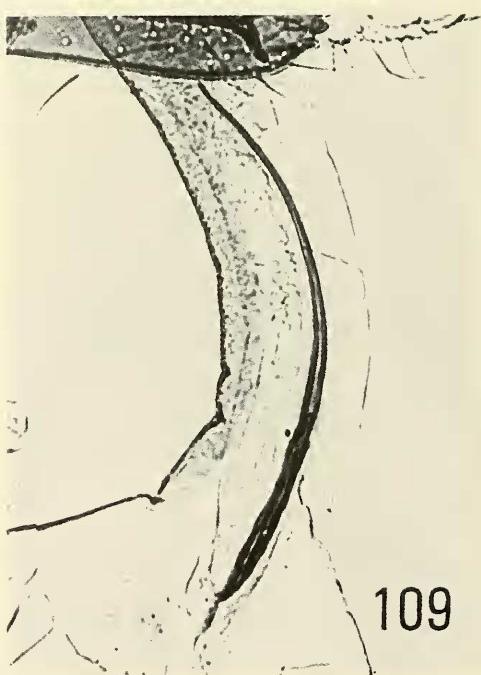
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110

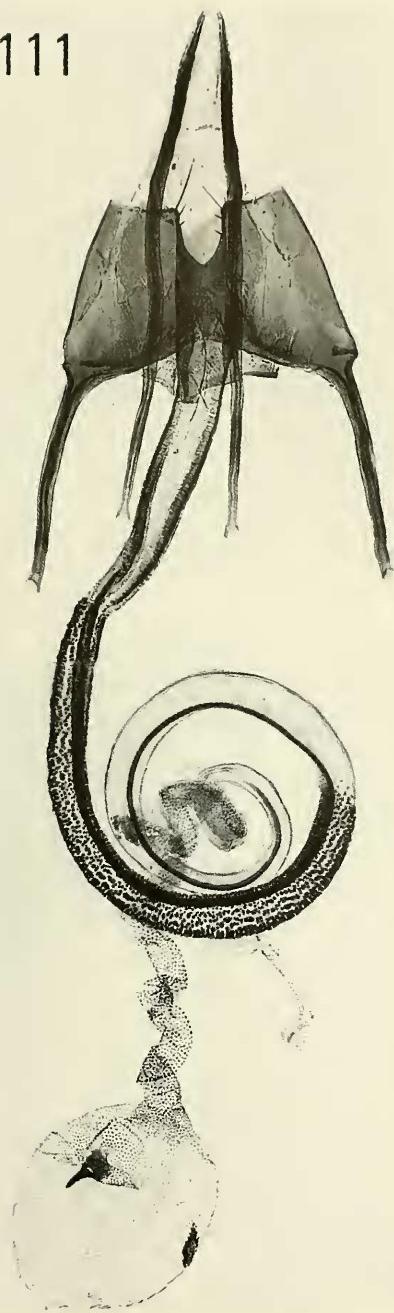


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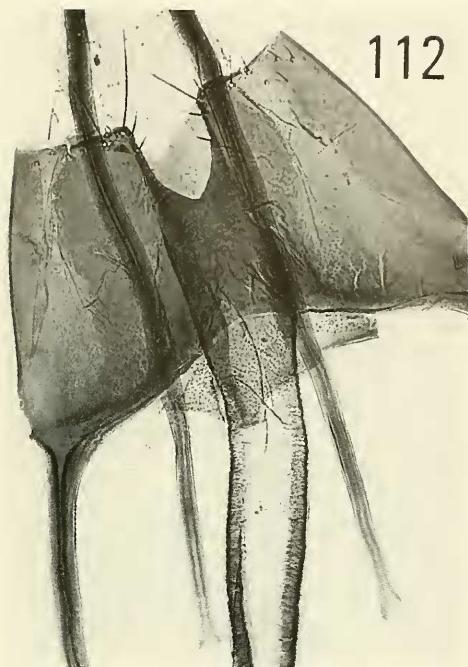


Figs. 107-110. *C. tremefacta* Meyrick ?, slide BMNH 24466 'Queensland, T.P.L./95', coll. BMNH, 107, male genitalia, 108, detail of male genitalia at high magnification, 109, cornuti at high magnification, 110, abdomen.

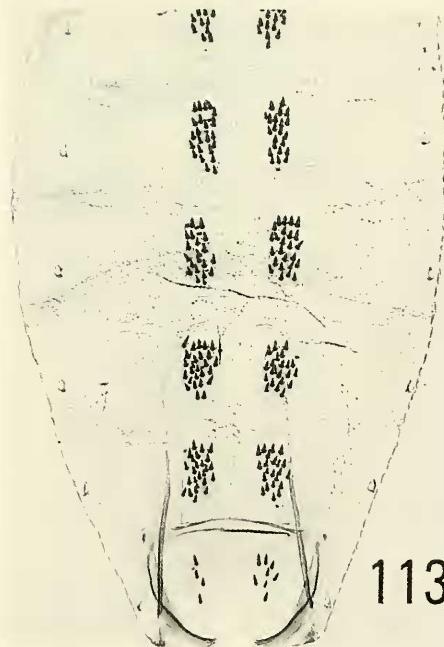
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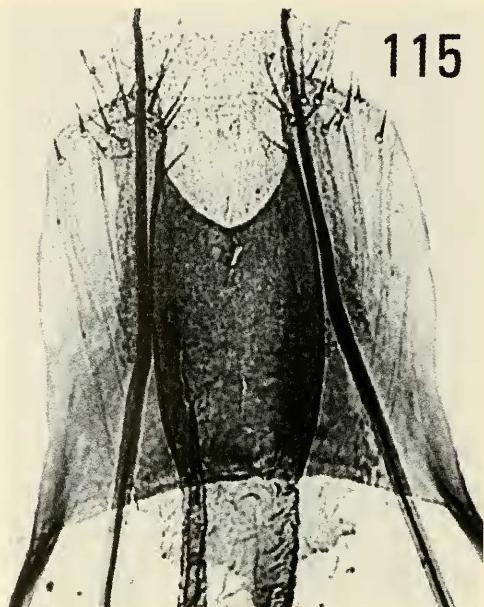


Figs. 111-113. *C. tremefacta* Meyrick, slide BMNH 24462, 111, female genitalia, 112, sterigma at high magnification, 113, abdomen.

114



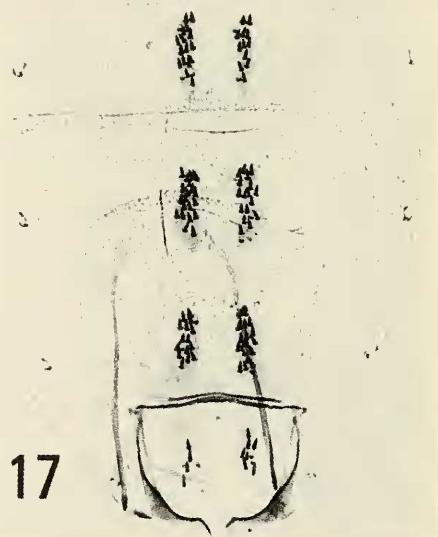
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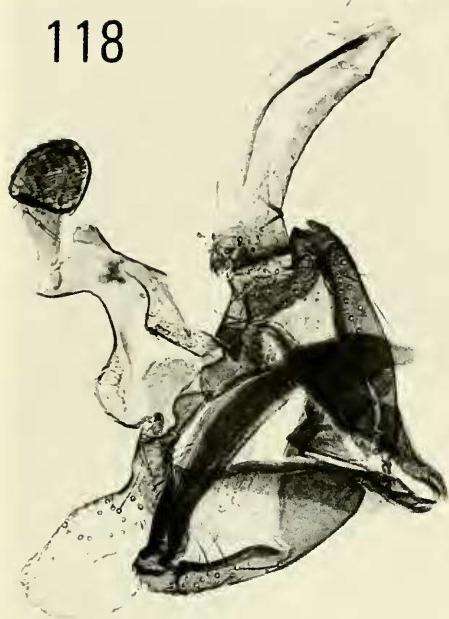


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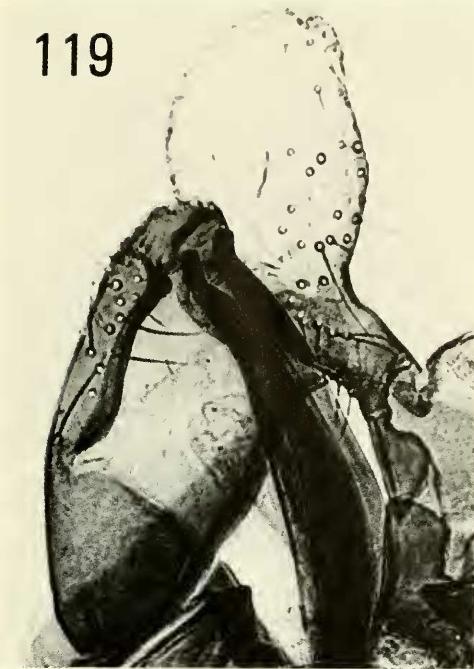


Figs. 114-117. *C. nielseni* sp. n., slide ANIC 2372, holotype, 114, female genitalia, 115, sterigma at high magnification, 116, signum at high magnification, 117, abdomen.

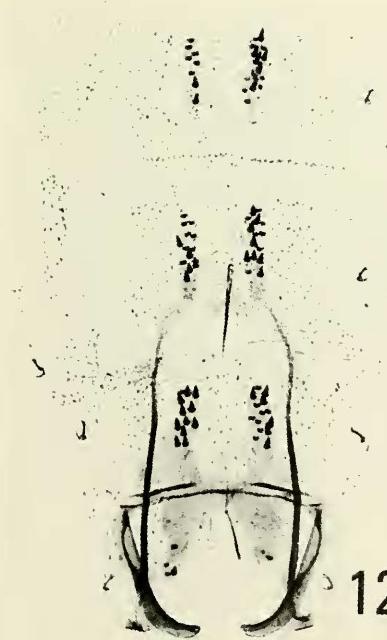
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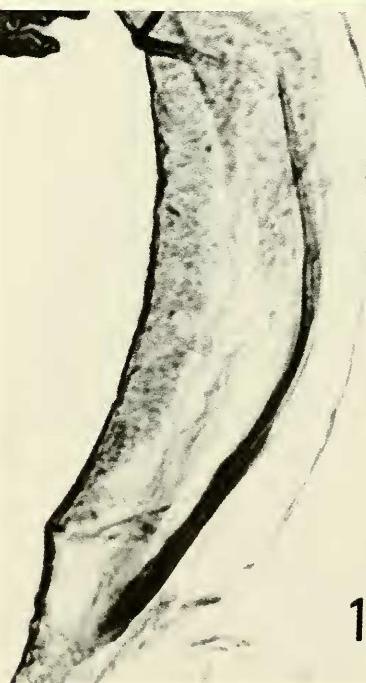
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121

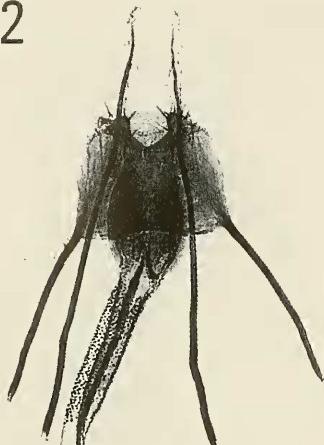


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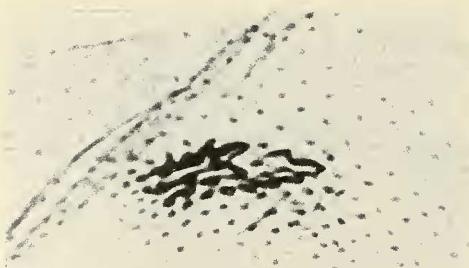


Figs. 118-121. *C. borakae* sp. n., slide ANIC 2314, holotype, 118, male genitalia, 119, detail of male genitalia at high magnification, 120, detail of cornuti at high magnification, 121, abdomen.

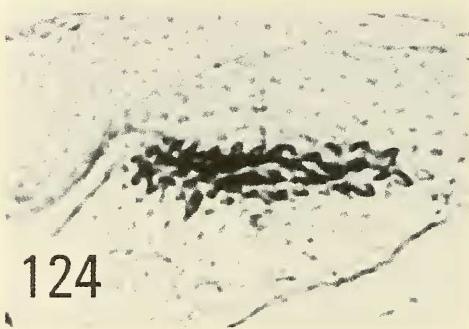
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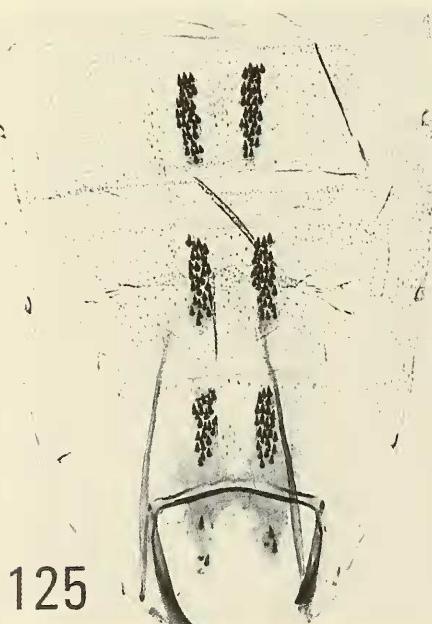
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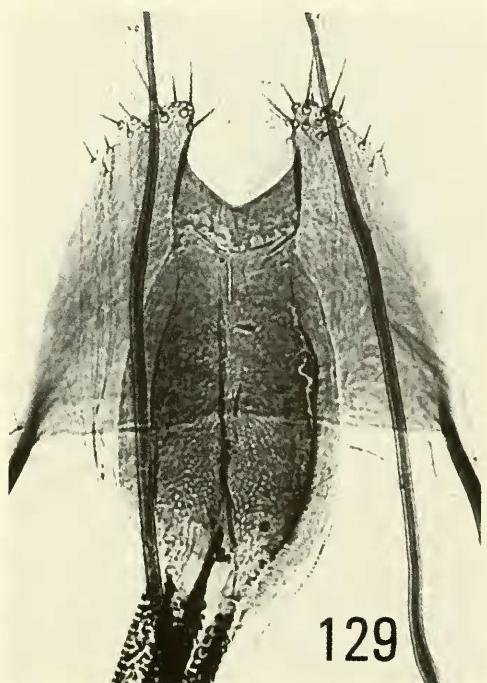
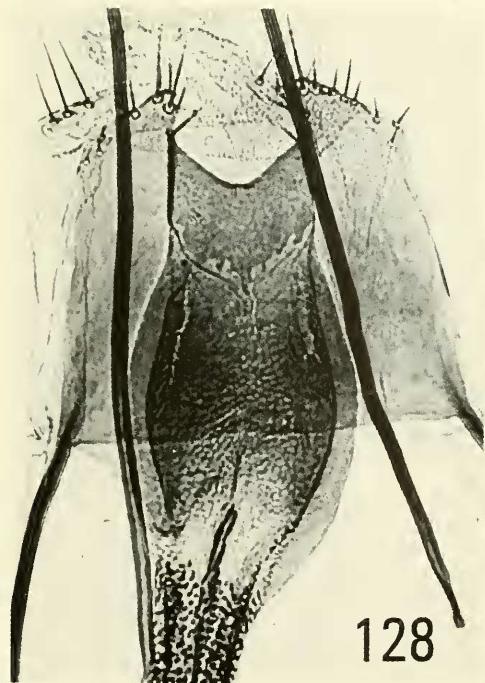
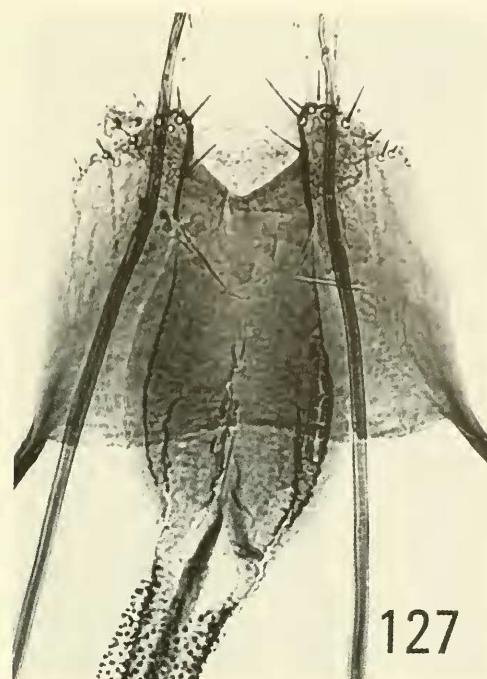
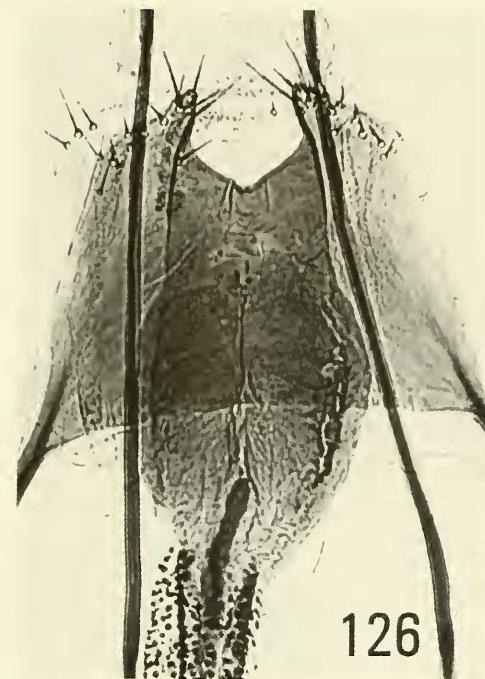
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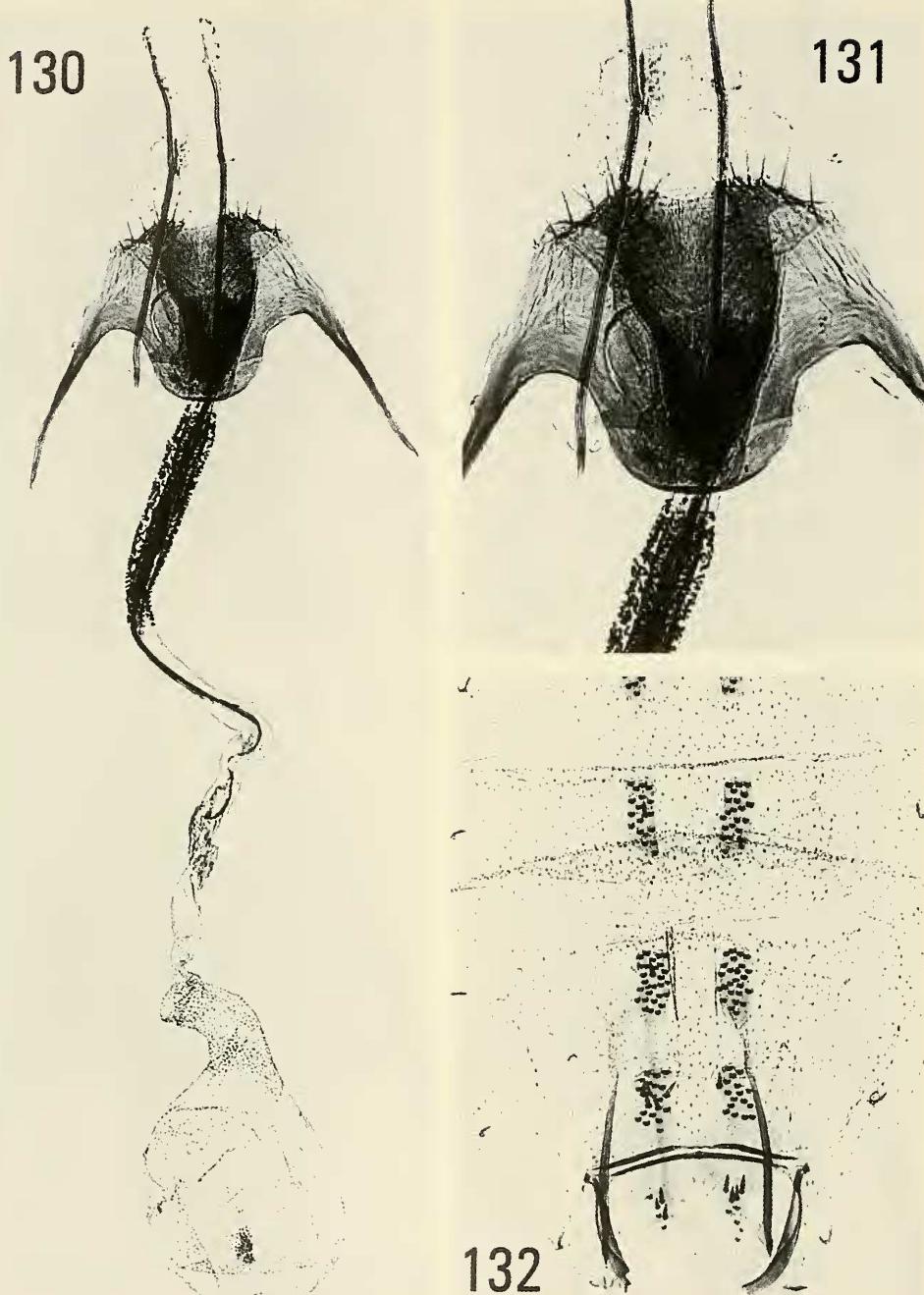
125



Figs. 122-125. *C. horakae* sp. n., slide ANIC 2319, 122, female genitalia, 123, signum at high magnification, 124, signum at high magnification, slide ANIC 2309, 125, abdomen.

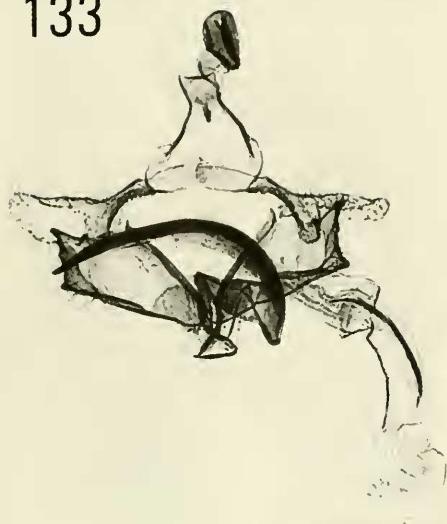


Figs. 126-129. *C. horakae* sp. n., female genitalia, sterigma at high magnification, 126, slide ANIC 2373, 127, slide ANIC 2319, 128, slide ANIC 2379, 129, slide ANIC 2309.

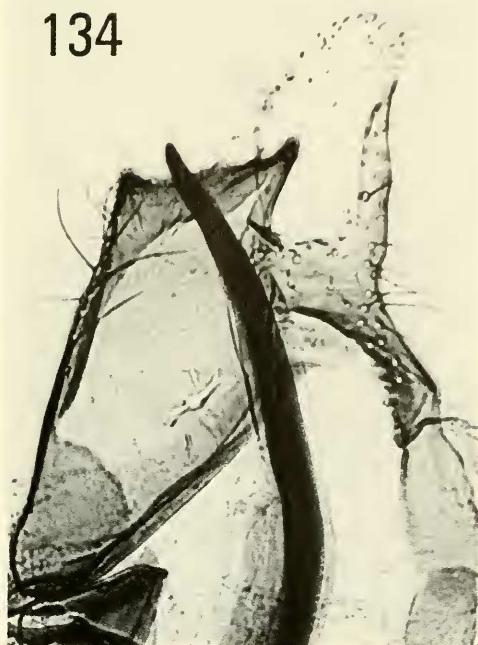


Figs. 130-132. *C. fuscosquamata* sp. n., slide ANIC 2356, holotype, 130, female genitalia, 131, sterigma at high magnification, 132, abdomen.

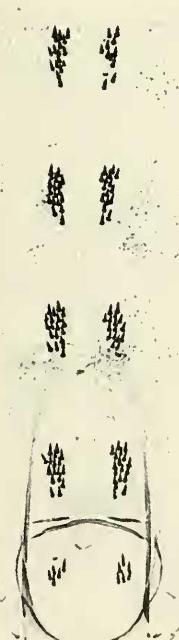
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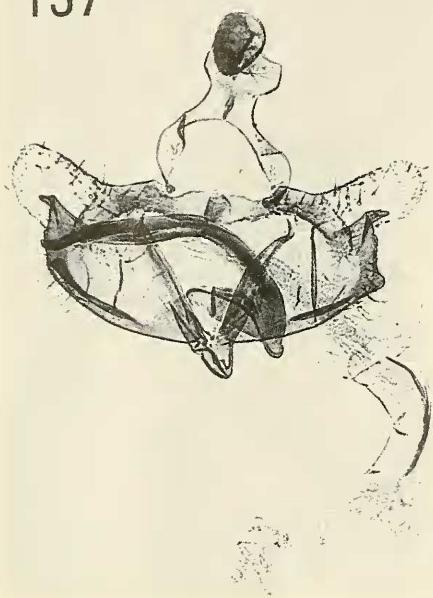


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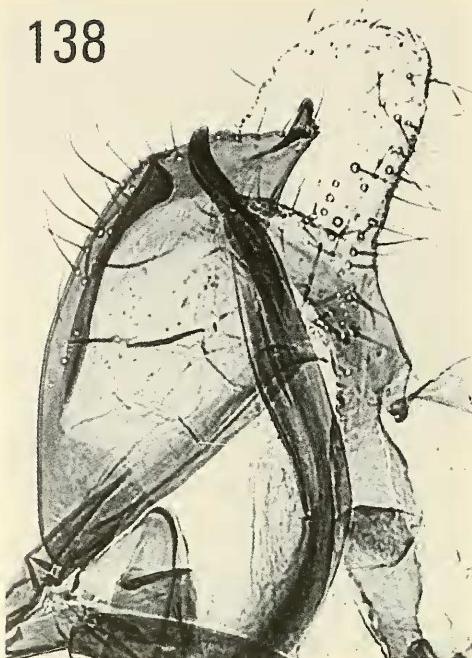


Figs. 133-136. *C. frustrata* sp. n., slide ANIC 2342, holotype, 133, male genitalia, 134, detail of male genitalia at high magnification, 135, cornuti at high magnification, 136, abdomen.

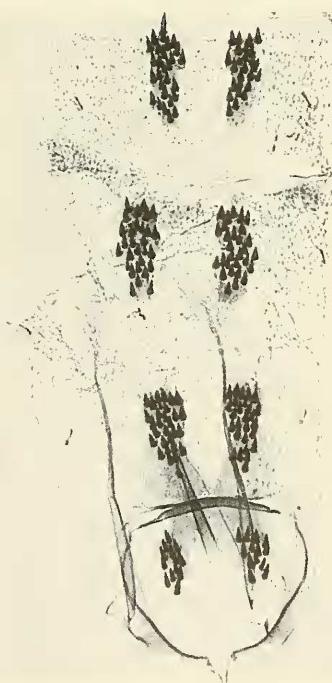
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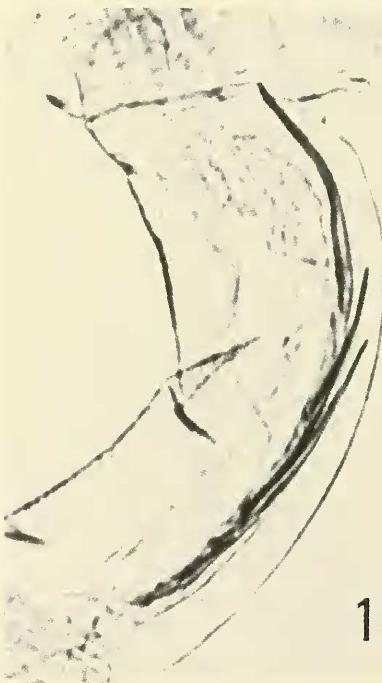
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140

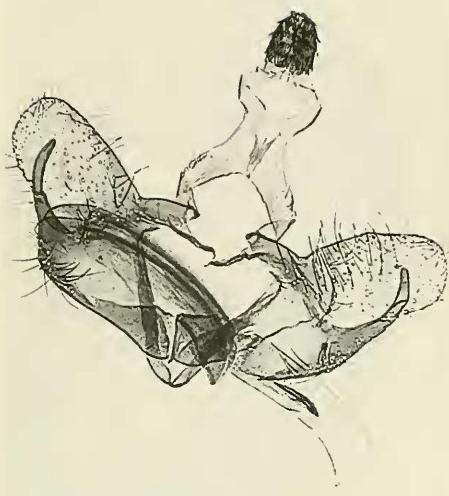


139

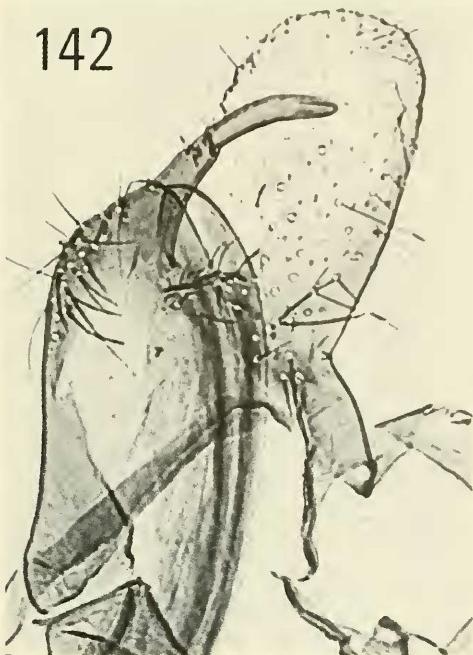


Figs. 137-140. *C. rustica* sp. n., slide 2351, holotype, 137, male genitalia, 138, detail of male genitalia at high magnification, 139, cornuti at high magnification, 140, abdomen.

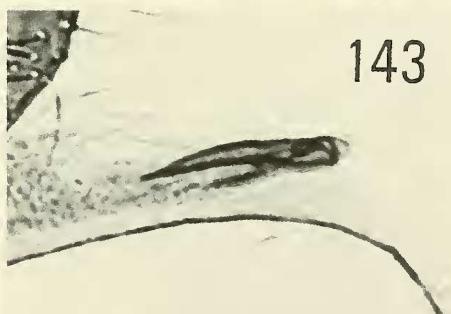
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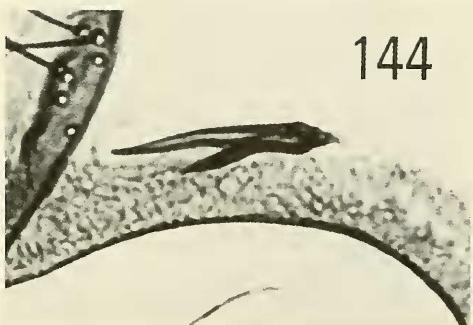
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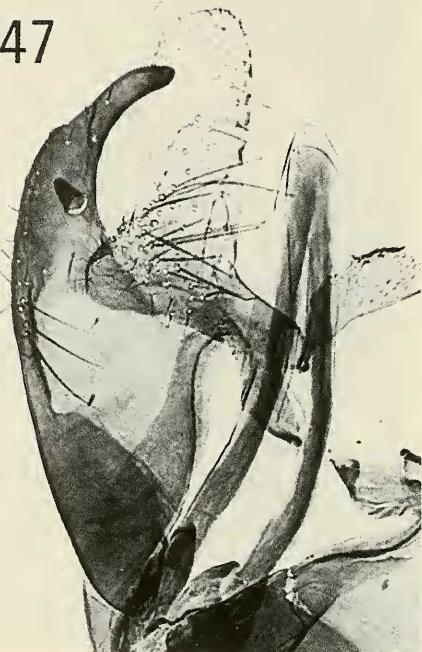


Figs. 141-145. *C. albiradiata* sp. n., slide ANIC 2361, 141, male genitalia, 142, detail of male genitalia at high magnification, 143, cornuti at high magnification, 144, cornuti at high magnification, slide ANIC 2321, 145, abdomen.

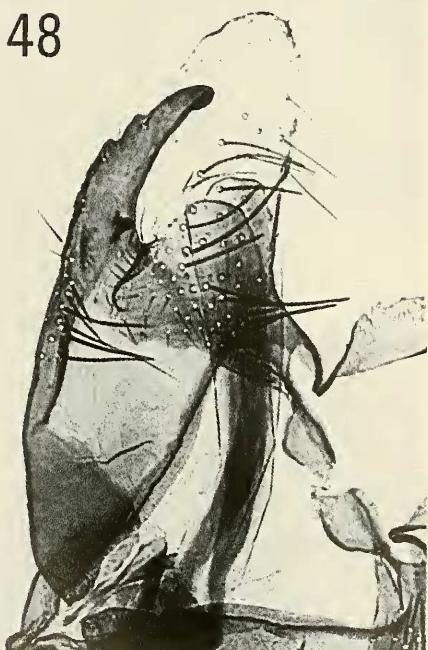
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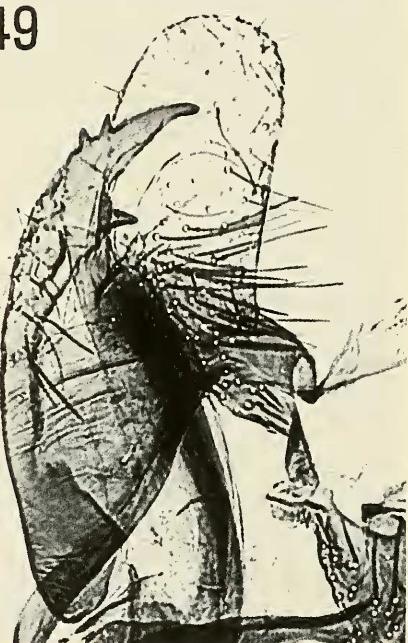
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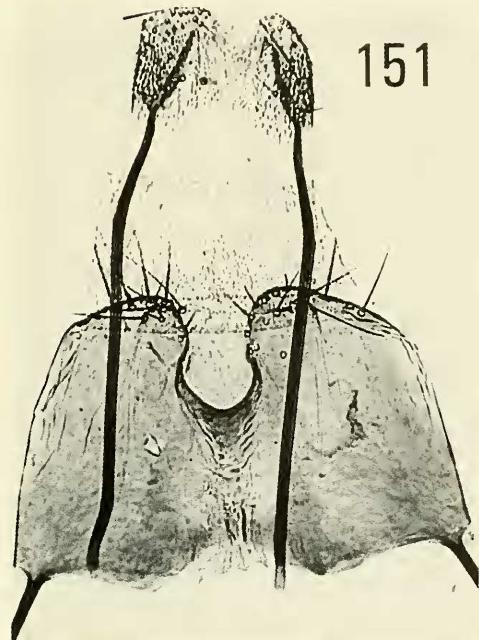


Figs. 146-149. *Coleophora* spp., detail of male genitalia at high magnification, 146, *C. albiradiata* sp. n., slide ANIC 2337, 147, *C. yomogiella* Oku, slide Bldz 6923, paratype 'Japan, Morioka, Iwate, Honshu, 21.VI.1973, c.l. *Artemisia princeps*, leg. Oku', coll. Baldizzone, 148, *C. kurokoi* Oku, slide Bldz 6920, paratype 'Japan, Sakai, 24. -30.V.1971, V. Arita leg.', coll. Baldizzone, 149, *C. chrysanthemi* Hofman, slide Bldz 5937 'Italia, Piemonte, Asti, Boschi di Valmanera, 15.V.1982, leg. Baldizzone', coll. Baldizzone.

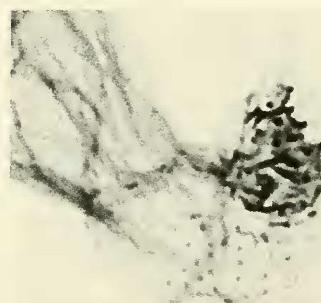
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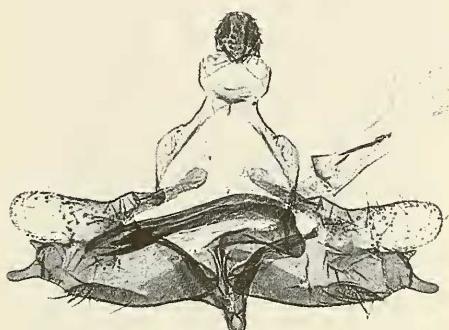


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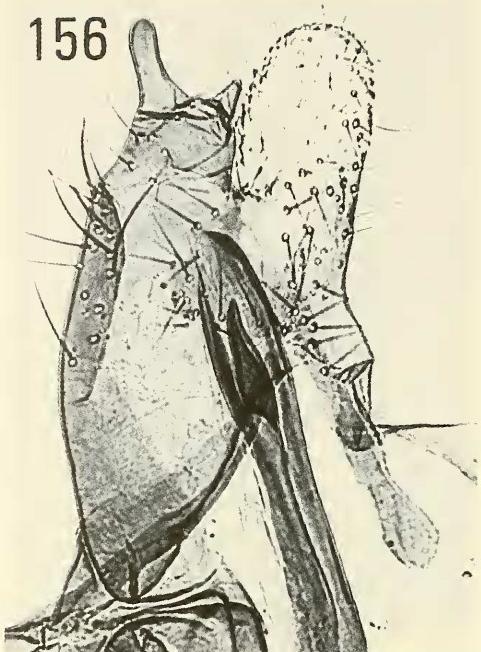


Figs. 150-154. *C. albiradiata* sp. n., slide ANIC 2335, 150, female genitalia, 151, sterigma at high magnification, 152, detail of ductus bursae at high magnification, slide ANIC 2320, 153, same detail, slide ANIC 2335, 154, abdomen.

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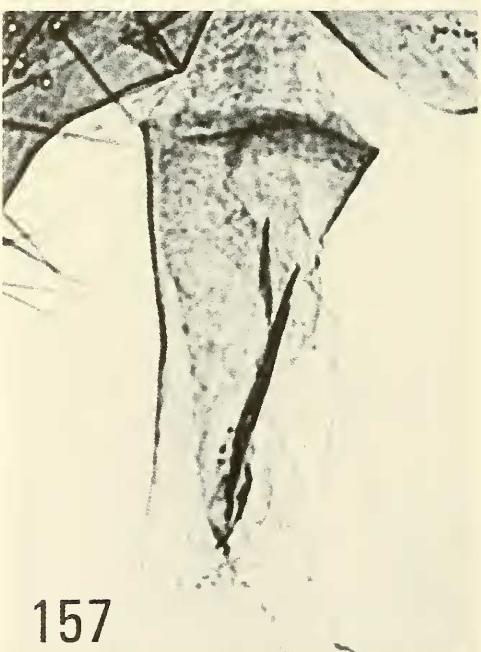
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Figs. 155-158. *C. consumpta* sp. n., slide ANIC 2360, holotype, 155, male genitalia, 156, detail of male genitalia at high magnification, 157, cornuti at high magnification, 158, abdomen.